

Service Manual

ORDER NO.CHM0606039CE

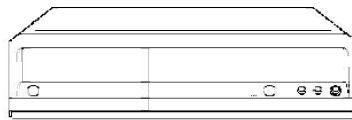
DVD Recorder

DMR-ES15PL

Vol. 1

Colour

(S).....Silver Type



Notes: This model's RAM/Digital P.C.B.
Module is - RFKNES15PL(PL).

Caution:
Pairing of RAM Drive and Digital P.C.B. as "RAM/
Digital P.C.B. Module" have to be replaced together.
If the pairing is changed, RAM Drive unit has to be
re-aligned. Because the alignment data for RAM Drive
Unit is stored in Digital P.C.B..

SPECIFICATIONS

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 WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

1. Safety Precaution

1.1. General guidelines

- 1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.**
- 2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.**
- 3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.**

1.1.1. Leakage current cold check

- 1. Unplug the AC cord and connect a jumper between the two prongs on the plug.**
- 2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1M and 5.2M .**
When the exposed metal does not have a return path to the chassis, the reading must be .

Figure 1

1.1.2. Leakage current hot check / (See [Figure 1](#) .)

- 1. Plug the AC cord directly into the AC outlet. Do not use an isolation**

transformer for this check.

2. Connect a 1.5k Ω , 10 watts resistor, in parallel with a 0.15 F capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in [Figure 1](#).
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliampere. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

2. Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatic Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatic Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistor-sand semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal

devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by Δ in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

2.2. Precaution of Laser Diode

CAUTION:

This product utilizes a laser diode with the unit turned on, invisible laser radiation is emitted from the pickup lens.
Wave length: 662 nm (Violet) 780 nm (CDs)
Maximum output radiation power from pickup: 100 μW/VDE

Laser radiation from the pickup lens is safety level, but be sure the following:

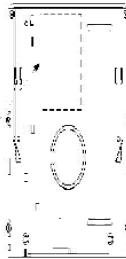
1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit, it was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommended not to look at pickup lens for a long time.

**ACHTUNG:**

Dieses Produkt enthält eine Laserdiode.
Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Laserdiode abgestrahlt.
Wellenlänge: 662 nm (Violet) 780 nm (CDs)
Maximale Strahlungsleistung der Laserdiode: 100 μW/VDE

Die Strahlung der Laserdiode ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Laserdiode nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Laserdiode nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.

**CAUTION**

THIS PRODUCT UTILIZES A LASER

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

2.3. Service caution based on legal restrictions

2.3.1. General description about Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30 degrees C (86°F) more than that of the normal solder.

Definition of PCB Lead Free Solder being used

The letter of “PbF” is printed either foil side or components side on the PCB using the lead free solder.
(See right figure)

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used.
(Definition: The letter of “PbF” is printed on the PCB using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.

- Remove the remaining lead free solder on the PCB cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350 ± 30 degrees C ($662\pm86^{\circ}\text{F}$).

Recommended Lead Free Solder (Service Parts Route.)

- The following 3 types of lead free solder are available through the service parts route.

RFKZ03D01K----- (0.3mm 100g Reel)

RFKZ06D01K----- (0.6mm 100g Reel)

RFKZ10D01K----- (1.0mm 100g Reel)

Note

* Ingredient: tin (Sn), 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

2.4. How to replace the Lithium Battery

REPLACEMENT PROCEDURE

1. Remove the Top case, Front Panel, RAM/Digital P.C.B. Module, DV Jack, Rear Panel, Front (L) P.C.B. and Main P.C.B. by referring the Disassembling Procedure.
2. Unsolder the Lithium Batteries: B7501 and then replace it into new one. (As shown in 13.2.4. The Main P.C.B.)

NOTE:

The lithium battery is a critical component. (Type No.: CR2354-1GUFE Manufactured by Panasonic.)

It must never be subjected to excessive heat or discharge.

It must therefore only be fitted in equipment designed specifically for its use.

Replacement batteries must be of the same type and manufacture.

They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose.

It should be disposed of in waste products destined for burial rather than incineration.

(For English)

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacturer's instructions.

(For French)

PRECAUTION

Le fait de remplacer incorrectement la pile peut présenter des risques d'explosion.
Remplacer la pile uniquement par une pile identique ou de type équivalent recommandée par le fabricant. Se débarrasser des piles usagées conformément aux instructions du fabricant.

3. Service Navigation

3.1. Service Information

This service manual contains technical information which will allow service personnel to understand and service this model.

Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, this information will be replaced by equipment service manual to be filled with original service manual.

1) This service manual does not contain the following information, because of the impossibility of servicing at component level.

- * Schematic Diagram, Block Diagram and P.C.B. layout of RAM/Digital P.C.B. Module
- * Parts List for individual parts of RAM/Digital P.C.B. Module
- * Exploded View and Parts List for individual parts of RAM/Digital P.C.B. Module.

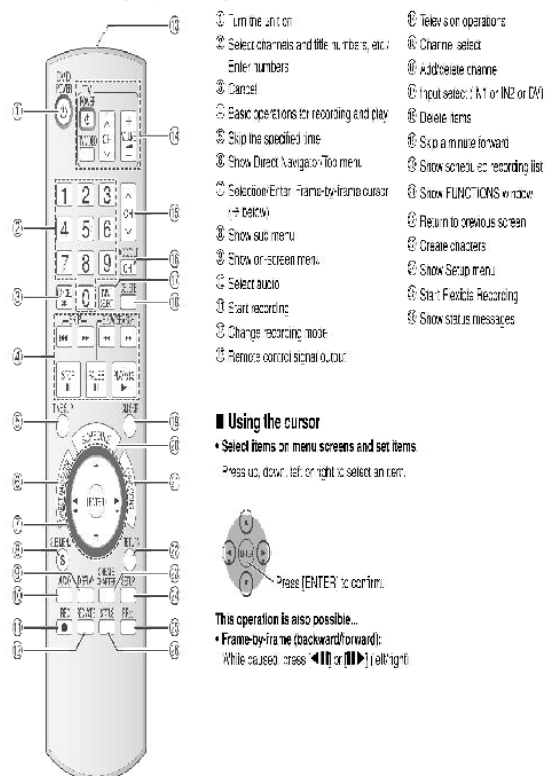
2) The following category are recycle module part. Please send them to Central Repair Center.

- * RAM/Digital P.C.B. Module (ES15P2RHKNES15P2)

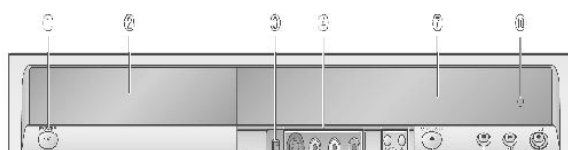
4. Specifications

Remote control

Instructions for operations are generally described using the remote control.



Main unit



6. Operation Instructions

6.1. Taking out the Disc from DVD-Drive Unit when the Disc cannot be ejected by OPEN/CLOSE button

6.1.1. Forcible Disc Eject

6.1.1.1. When the power can be turned off.

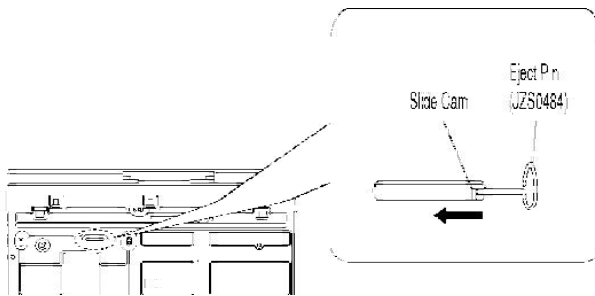
1. Turn off the power and press [STOP] [CH UP] keys on the front panel simultaneously for 5 seconds.

6.1.1.2. When the power can not be turned off.

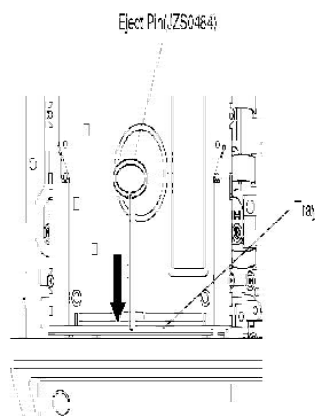
1. Press [POWER] key on the front panel for over 10 seconds to turn off the power forcibly, and press [STOP] [CH UP] keys on the front panel simultaneously for 5 seconds.

6.1.2. When the Forcible Disc Eject can not be done.

1. Turn off the power and pull out AC cord.
2. Remove the Top Case.
3. Put deck so that bottom can be seen.
4. Slide SLIDE CAM by Eject Pin (JZJ0484) or minus screw driver (small) in the direction of arrow to eject tray slightly.



5. Put deck upward, and push out Tray by Eject Pin (JZS0484) or minus screw driver (small).



7. Service Mode

7.1. Self-Diagnosis and Special Mode Setting

7.1.1. Self-Diagnosis Functions

Self-Diagnosis Function provides information for errors to service personnel by “Self-Diagnosis Display” when any error has occurred.

U**, H** and F** are stored in memory and held.

You can check latest error code by transmitting [0] [1] of Remote Controller in Service Mode.

Automatic Display on FL will be cancelled when the power is turned off or AC input is turned off during self-diagnosis display is ON.

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
U30	Remote control code error	Display appears when main unit and remote controller codes are not matched.	No display	“**” is remote controller code of the main unit. Display for 5 seconds
U59	Abnormal inner temperature detected	Display appears when the drive temperature exceeds 70°C. The power is turned off forcibly. For 30 minutes after this, all key entries are disabled. (Fan motor operates at the highest speed for the first 5 minutes. For the remaining 25 minutes, fan motor is also stopped.) The event is saved in memory as well.	No display	“U59 is displayed for minutes.
U61	The unit is carrying out its recovery process.		No display	

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
U88	The unit is carrying out its recovery process. (with a disc in the disc tray)	The unit detected an error while recording or playing with a disc in the disc tray. The unit is carrying out its recovery process. This process restores the unit to normal operation. The unit is not broken. Wait until the message disappears.	No display	
U99	Hang-up	Displayed when communication error has occurred between Main microprocessor and Timer microprocessor.	No display	Displayed is left until [POWER] key is pressed
F00	No error information	Initial setting for error code in memory (Error code Initialization is possible with error code initialization and main unit initialization.)	No display	No display
F58	Drive hardware error	When drive unit error is detected, the event is saved in memory.	No display	No display
F34	Initialization error when main microprocessor is started up for program recording	When initialization error is detected after starting up main microprocessor for program recording, the power is turned off automatically. The event is saved in memory.	No display	No display
UNSUPPORTED	Unsupported disc error	*An unsupported format disc was played, although the drive starts normally. *The data format is not supported, although the media type is supported. *Exceptionally in case of the disc is dirty.	"This disc is incompatible."	Display for 5 seconds
NO READ	Disc read error	*A disc is flawed or dirty. *A poor quality failed to start. *The track information could not be read.	"Cannot read. Please check the disc."	
HARD ERR	Drive error	The drive detected a hard error.	"DVD drive error."	Display for 5 seconds
IR ERR	IR communication error	[IR ERR] is displayed when communication between Timer microprocessor and IR microprocessor fails.	No display	

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
No REC	Recording is impossible	[No REC] is displayed when recording is impossible due to the defect, dirt or wound of media.	No display	
SELF CHECK	Restoration operation	Since the power cord fell out during a power failure or operation, it is under restoration operation. *It will OK, if a display disappears automatically. If a display does not disappear, there is the possibility that defective Digital P.C.B. / RAM drive.	No display	
PLEASE WAIT	Unit is in termination process	Unit is in termination process now. “BYE” is displayed and power will be turned off. In case “Quick Start” of setup menu is ON, it is displayed in restoration operation for AC off.	No display	
UNFORMAT	Unformatted disc error	You have inserted an unformatted DVD-RAM or DVD-RW that is unformatted or recorded on other equipment.		

7.1.2. Special Modes Setting

Item		FL display	Key operation
Mode name	Description		Front Key
TEST Mode	*All the main unit's parameters (include tuner) are initialized.		Press [STOP], [CH UP] and [OPEN/CLOSE] keys simultaneously for five seconds when power is off.
Rating password	The audiovisual level setting password is initialized to “Level 8”.		Open the tray, and press [REC] and [PLAY] simultaneously for 5 seconds.
Service Mode	Setting every kind of modes for servicing. *Details are described in “7.1.3. Service Mode at a glance”.		When the power is off, press [CH UP], [OPEN/CLOSE] and [REC] key simultaneously for 5 seconds.

Item		FL display	Key operation
Mode name	Description		Front Key
Forced disc eject	Removing a disc that cannot be ejected. The tray will open and unit will shift to P-off mode. *When Timer REC is ON or EXT-LINK is ON, execute " Forced disc eject " after releasing Timer REC or EXT-LINK. *This command is not effective during "Child lock" is ON. While Demonstration Lock is being set, this Forced disc eject function is not accepted. If this command was executed while TIMER REC is being set, TIMER REC setting will turn to OFF	The display before execution leaves.	When the power is off, press [STOP] and [CH] keys simultaneously for 5 seconds.
Forced power-off	When the power button is not effective while power is ON, turn off the power forcibly. *When Timer REC is ON or EXT-LINK is ON, execute "Forced Power-off" after releasing Timer REC or EXT-LINK.	Display in P-off mode.	Press [Power] key over 10 seconds.

Item		FL display	Key operation
Mode name	Description		Front Key
Aging	Perform sequence of modes as * Aging Description shown below continually. Caution: All programs in DVD-RAM disc will be deleted because Formatting is done once in Aging process.	Display following the then mode.	When the power is ON, press [STOP], [POWER] and [OPEN/CLOSE] simultaneously for over 10 seconds and less than 30 seconds. NOTE1: If Unit has not turned in Aging mode by operation shown above, execute TEST MODE once and execute operation shown above. (*All the main unit's parameters include turn on are initialized by TEST mode.) NOTE2: If the unit has hung-up because of pressing key for over 10 seconds, or turn off the power, and execute this command *When releasing Aging mode, press [POWER]
Aging Contents (Example):			

Item		FL display	Key operation
Mode name	Description		Front Key
Demonstration lock/unlock	Ejection of the disc is prohibited. The lock setting is effective until unlocking the tray and not released by “Main unit initialization” of service mode.	*When lock the tray. “LOCK” is displayed for 3 seconds.	When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds.
		*When unlock the tray. “UNLOCK” is displayed for 3 seconds.	When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds.
		*When press OPEN/CLOSE key while the tray being locked. Display “LOCK” for 3 seconds.	Press [OPEN/CLOSE] key while the tray being locked.
ATP Initialization	ATP setting is initialized, and the unit turns off automatically.	It is same with display in stop mode.	When the power is on (standby mode), press [CH UP] and [CH DOWN] simultaneously for 5 seconds.
Progressive initialization	The progressive setting is initialized to Interlace.	The display before execution leaves.	When the power is on (standby mode), press [STOP] and [PLAY] simultaneously for 5 seconds.

7.1.3. Service Modes at a glance

Service mode setting: While the power is off, press REC, CH UP and OPEN / CLOSE simultaneously for five seconds.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Release Items	Item of Service Mode executing is cancelled.		Press [0] [0] or [Return] in service mode.
Error Code Display	Last Error Code of U/H/F held by Timer is displayed on FL. *Details are described in “7.1.1. Self-Diagnosis Functions”.	If any error history does not exist, [F00] is displayed.	Press [0] [1] in service mode
ROM Version Display	1. Region code (displayed for 5 sec.) 2. Main firm version (displayed for 5 sec.) 3. Timer firm version (displayed for 5 sec.) 4. Drive firm version (displayed for 5 sec.) 5. ROM correction version (left displayed)	“” are version displays.	Press [0] [2] in service mode
White Picture Output	White picture is output as component Output from AV Decoder. *White picture (Saturation rate : 100%) *It is enable to switch Interlace/Progressive by “I/P switch: [1] [4]”	*Initial mode is “Interlace”.	Press [1] [1] in service mode.
		Switch Interlace/Progressive	Press [1] [4] in White Picture Output mode. *I/P are switched alternately.
Magenta Picture Output	Magenta picture is output with Component Output from AV Decoder. *Magenta picture (Saturation rate: 100%) *It is enable to switch Interlace/Progressive by “I/P switch: [1] [4]”	*Initial mode is “Interlace”.	Press [1] [2] in service mode.
		Switch Interlace/Progressive	Press [1] [4] in Magenta Picture Output mode. *I/P are switched alternately.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
RTSC Return in XP (A & V)	L1 input signal is encoded (XP), decoded (XP) and output decoded signal to external without DISC recording and DISC playback.	Initial mode: EE2/ Interlace/ XP/ Audio 48kHz	Press [1] [3] in service mode.
		Switch Interlace/ Progressive	Press [1] [4] in RTSC Return XP mode. *I/P are switched alternately.
		Audio 44.1 kHz/ 48 kHz Switch	Press [2] [4] in RTSC Return XP mode. *48 kHz / 44.1 kHz are switched alternately.
I/P Switch	Switch Interlace and Progressive in EE mode. *Initial setting is "Interlace". *This command is effective during executing "White Picture Output", "Magenta Picture Output" and "RTSC Return in XP (A & V)" modes.	Initial mode is Interlace Switch Interlace/ Progressive	Press [1] [4] in I/P Switch mode. *I/P are switched alternately.
Audio Mute (XTMUTE)	Check whether mute is applied normally by the timer microprocessor.		Press [2] [1] in service mode.
Audio Mute (XDMUTE)	Check whether mute is applied normally by the Digital P.C.B..		Press [2] [2] in service mode.
Audio Pattern Output	The audio pattern stored in the internal memory is output (Lch: 1kHz/-18dB) (Rch: 400Hz/-18dB) *Audio sound clock switching operation of DAC can be confirmed by sub command [2] [4].	Initial mode (Audio 48kHz)	Press [2] [3] in service mode.
		Audio 44.1kHz/48kHz switching	Press [2] [4] in Audio Pattern Output mode. *48 kHz / 44.1 kHz are switched alternately.
Laser Used Time Indiction	Check laser used time (hours) of drive.	(*****) is the used time display in hour. Laser used time of DVD / CD in Playback/ Recording mode is counted.	Press [4] [1] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller k
Delete the Laser Used Time	Laser used time stored in the memory of the unit is deleted.		Press [9] [5] in service mode.
RAM Drive Last Error	RAM Drive error code display. *For details about the drive error code, refer to the Service Manual for the specific RAM Drive.	1. Error Number is displayed for 5 seconds. 2. Time when the error has occurred is displayed for 5 seconds. DD: Day hh: Hour mm: Minute 3. Last Drive Error (1/2) is displayed for 5 seconds. 4. Last Drive Error (2/2) is displayed for 5 seconds. 5. Error occurring Disc type is displayed for 5 seconds. 6. Disc Maker ID is displayed for 5 seconds. 7. Factor of Drive Error occurring is left displayed	Press [4] [2] in service mode. When “INFO*****” is being displayed, past 1 error histories can be displayed by pressing [1] - [1] [9] In case that the maker cannot be identified, display is black out.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Delete the Last Drive Error	Delete the Last Drive Error information stored on the DVD RAM-Drive.		Press [9] [6] in service mode.
Laser power confirmation	Drive state is judged based on difference between laser power value at shipping and present laser power value.	If DVD-RAM disc is not inserted, [NO DISC] is displayed. If power value study was filed, [ERROR] is displayed.	1. into RAM Drive in service mode (Other media are assumed to be correspondence.) 2. Press [4] [4].
Turn on all FL/LEDs	All segments of FL and all LEDs are turned on.	All segments are turned on.	Press [5] [1] in service mode.
S1 signal output	Forcibly superimpose the S1 signal (approx. 4.5V DC) on the EE chroma signal, and check the output on the S terminal.		Press [5] [2] in service mode.
S2 signal output	Forcibly superimpose the S2 signal (approx. 2V DC) on the EE chroma signal, and check the output on the S terminal.		Press [5] [3] in service mode.
Front connection inspection	Press all front keys and check the connection between Main P.C.B. and Front key Switches.	(1) Each time a key is pressed, segment turned on increases one by one. (2) Total number of keys that have been pressed.	Press [5] [4] in service mode.
Production Date Display	Display the date when the unit was produced.	YY: Year MM: Month DD: Day	Press [6] [1] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Display the accumulated working time	Display the accumulated unit's working time.	(Indicating unit: Second)	Press [6] [4] in service mode.
Display the Error History	Display the Error History stored on the unit.	Display reason of error for 5 seconds. 01: Defect of Digital P.C.B. (AV DEC / MAIN CPU) 02: Defect of RAM Drive. 03: Defect of Disc. 04: Defect of Digital P.C.B. or Communication Error. 05: Defect of Digital P.C.B. (AV DEC / MAIN CPU) 06: Defect of HDD. Display the time when the error has occurred for 5 seconds. DD: Day hh: Hour mm: Minute Accumulated working time till occurring of the error is left displayed. (Indicating unit: Second)	Press [6] [5] in service mode. Then press [0] [1] ~ [1] the past 19 error history are displayed.
Delete the Error History	Delete Error History information stored on the unit.		Press [9] [7] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Tray OPEN/ CLOSE Test	The RAM drive tray is opened and closed repeatedly.	“*” is number of open/ close cycle times.	Press [9] [1] in service mode *When releasing this mode, press the [POWER] button of Remote Controller more than 1 seconds.
Error code initialization	Initialization of the last error code held by timer (Write in F00)		Press [9] [8] in service mode.
Initialize Service	Last Drive Error, Error history and Error Codes stored on the unit are initialized to factory setting.		Press [9] [9] in service mode.
Finishing service mode	Release Service Mode.	Display in STOP (E-E) mode.	Press power button on front panel or Remote controller in service mode.

8. Service Fixture & Tools

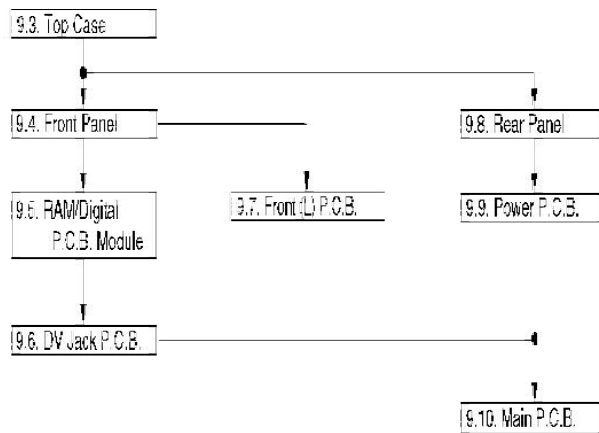
Part Number	Description	Compatibility
RFKZ0365	Extension Cable (Main P.C.B. - Digital P.C.B. / 64 Pin)	New
JZS0484	Eject Pin	Same as E50 Series
RFKZ03D01K	Lead Free Solder (0.3mm/100g Reel)	New
RFKZ06D01K	Lead Free Solder (0.6mm/100g Reel)	New
RFKZ10D01K	Lead Free Solder (1.0mm/100g Reel)	New
RFKZ0316	Solder Remover (Lead free 10W temperature Solder/180g)	New
RFKZ0328	Flux	New
RFKZ0329	Bottle of Flux	New

9. Disassembly and Assembly Instructions

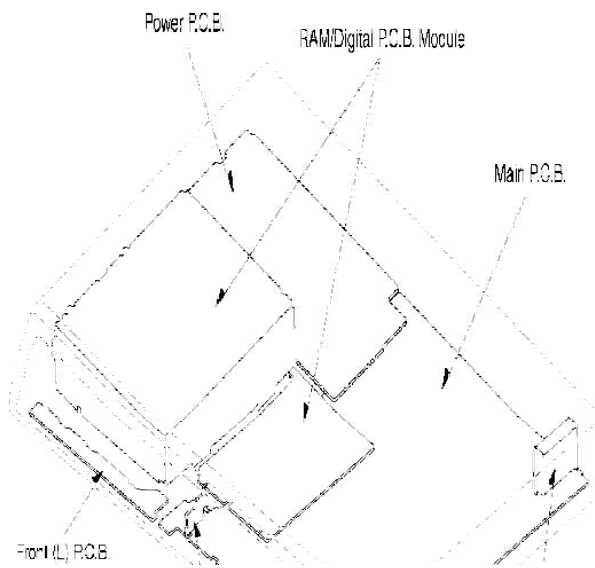
9.1. Disassembly Flow Chart

The following chart is the procedure for disassembling the casing and inside parts for internal inspection when carrying out the servicing.

To assemble the unit, reverse the steps shown in the chart below.

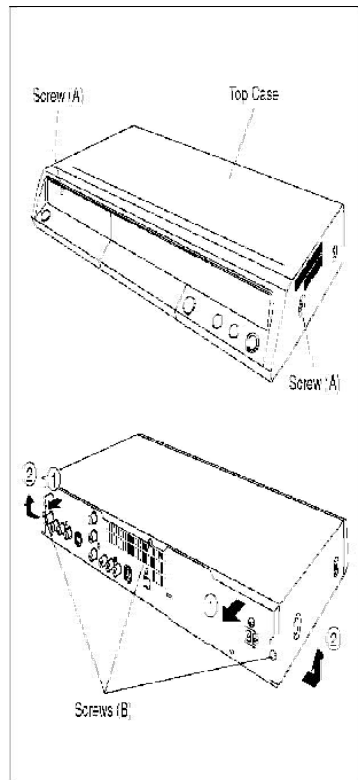


9.2. P.C.B. Positions



9.3. Top Case

1. Remove the 2 screws (A) and 3 screws (B).
2. Slide Top Case rearward and open the both ends at rear side of the Top Case a little and lift the Top Case in the direction of the arrows.



9.4. Front Panel

1. Unlock 6 tabs in (A) - (F) turn.

Pull with the front panel in the direction of your side.



9.5. RAM/Digital P.C.B. Module

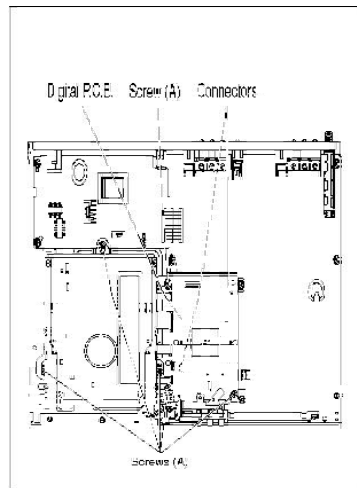
Caution:

Pairing of RAM Drive and Digital P.C.B. as "RAM/Digital P.C.B. Module" have to be replaced together. If the pairing is changed, RAM Drive unit has to be re-aligned. Because the alignment data for RAM Drive Unit is stored in Digital P.C.B..

Note:

After replacing RAM/Digital P.C.B. Module, "TM L1" is displayed on FL. Once power off, and start-up again.

- 1. Remove 6 Screws (A).**
- 2. Lift up Digital P.C.B. slightly so to disconnect Connectors to remove Digital P.C.B.**

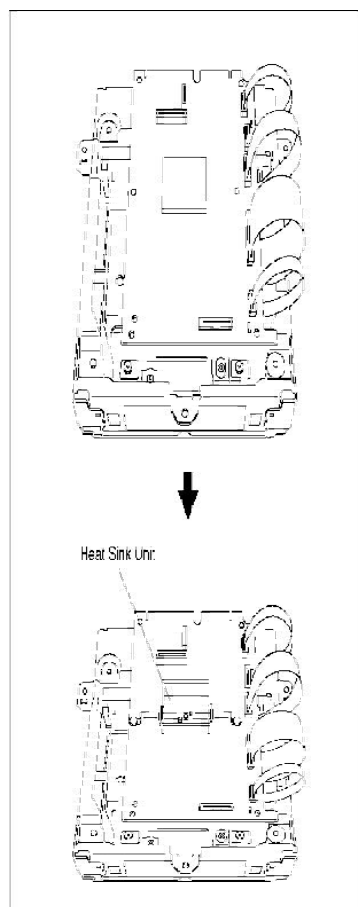


- 3. Put Digital P.C.B. on RAM Drive and remove RAM/Digital P.C.B. Module.**

Note:

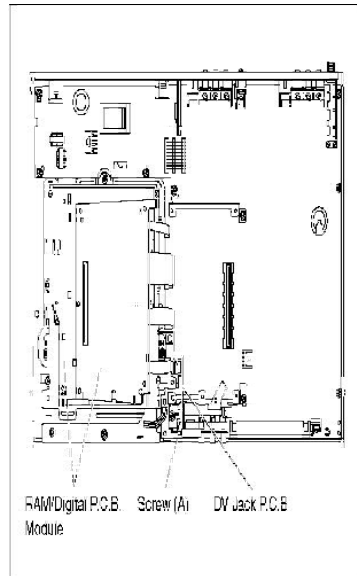
RAM/Digital P.C.B. Module as service part has no heat sink unit.

Before returning to customer, heat sink unit should be installed on Digital P.C.B..



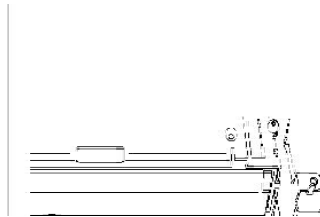
9.6. DV Jack P.C.B.

1. Remove a Screw (A) to remove DV jack P.C.B.



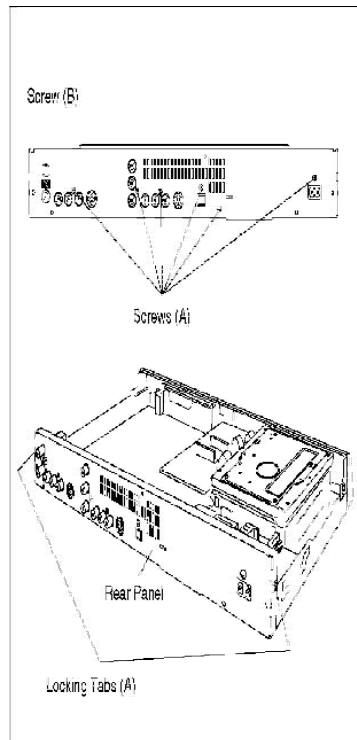
9.7. Front (L) P.C.B.

1. Remove 1 Screw (A).
2. Front (L) P.C.B. is removed in the direction of the arrow.
3. Unsolder soldering of wire and remove Front (L) P.C.B.



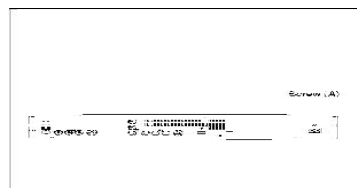
9.8. Rear Panel

1. Remove 6 Screws (A) and 1 Screw (B).
2. Unlock 2 Locking Tabs (A) to remove Rear Panel.

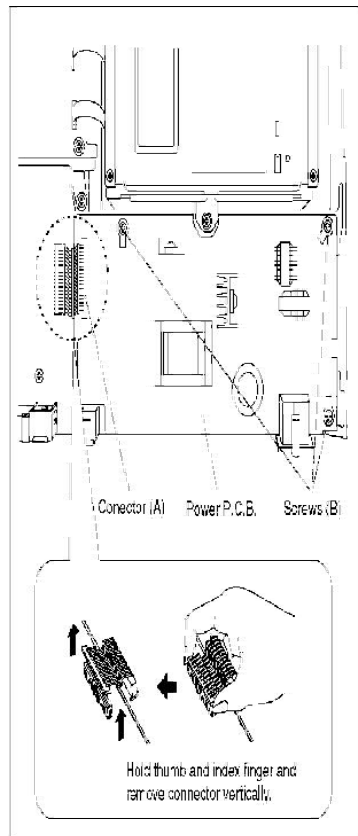


9.9. Power P.C.B.

1. Remove 1 Screw (A).



2. Remove 3 Screws (B) and disconnect conector (A) to remove Power P.C.B..



9.10. Main P.C.B.

1. Remove 8 Screws (A) and 1 Screw (B).
2. Remove Digital Angle to remove Main P.C.B.

10. Measurements and Adjustments

10.1. Service Positions

Note:
For description of the disassembling procedure, see the section 9.

10.1.1. Checking and Repairing Power P.C.B.

1. Top Case

Remove 2 Screws (A) on side

Remove 3 (two) Screws (B) on rear

Remove Top Case

2. Power P.C.B

Remove 1 Screw (A) for AC Inlet fixing

Remove 3 Screws (B) for Power P.C.B. fixing

Remove Connector (A) to Main P.C.B.

Connect Extens on Cable between Main P.C.B. and Power P.C.B. (AFKZ0216)

Put Power P.C.B. on Insulator on Board so that it's foil side faces top.

Caution:

Be careful that the extens or cable should be connected to (+) pin.

Extension Cable between Main P.C.B. and Power P.C.B. (AFKZ0216)

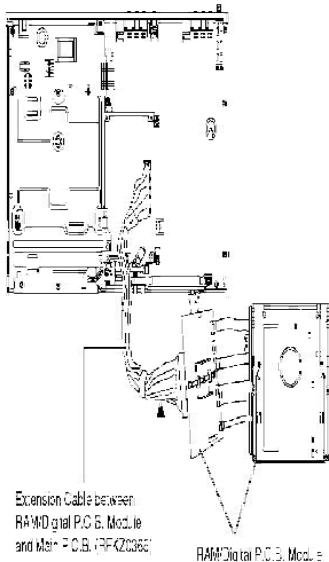
Foil side of Power P.C.B.

Connector (A)

Insulation Board

10.1.2. Checking and Repairing of RAM/Digital P.C.B. Module

1. Top Case Remove 2 Screws (A) on side Remove 3 rear Screws (B) on rear Remove Top Case	Caution: Be careful the extension cable should be connected to 1 pin.
2. Front Panel Unlock 1 Locking Tab on upper Unlock 2 Locking Tabs on side Unlock 3 Locking Tabs on bottom Remove Front Panel	
3. RAM/Digital P.C.B. Module Remove 3 Screws (A) fixing RAM/Digital P.C.B. Module Lift up Digital P.C.B. to remove it	
4. DV Jack P.C.B. Remove 1 Screw (A) fixing DV Jack P.C.B. Remove DV Jack P.C.B. Attach DV Jack P.C.B. on to Digital P.C.B. Put RAM/Digital P.C.B. Module on side. Connect Extension Cable between Main P.C.B. and RAM/Digital P.C.B. Module (FRKZ385)	

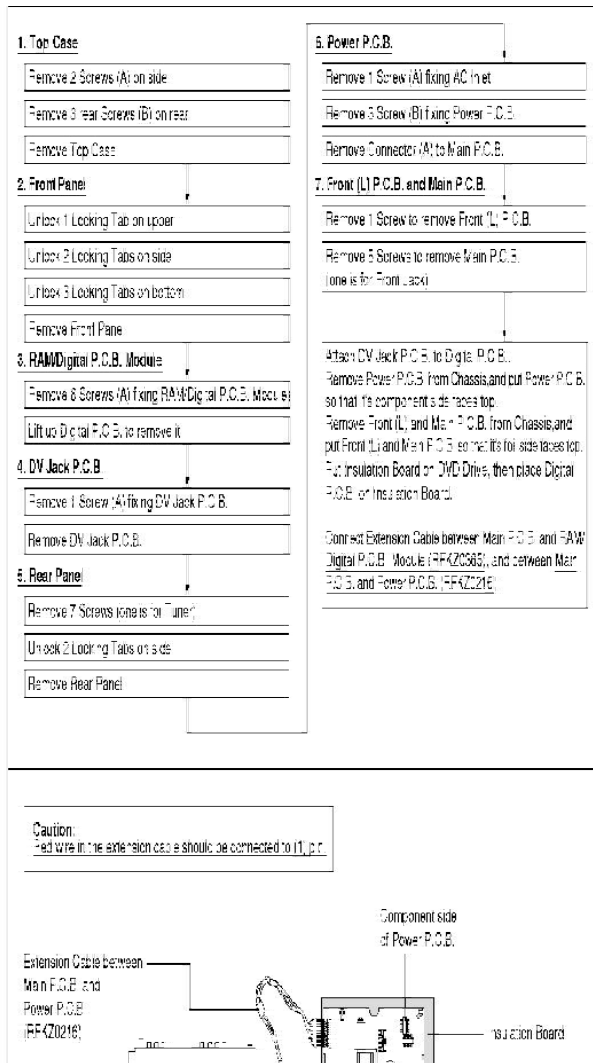


Extension Cable between RAM/Digital P.C.B. Module and Main P.C.B. (FRKZ385)

RAM/Digital P.C.B. Module

Red Wire (1 pin)

10.1.3. Checking and Repairing of Main P.C.B.



10.2. Notice after replacing RAM/Digital P.C.B. Module

[TM L1] id displayed after replacing RAM/Digital P.C.B. Module.

Once power off, and start up again.

10.3. When the unit does not operate normally after replacing the Timer Microprocessor or Main P.C.B.

When the unit does not operate normally after replacing the Timer Microprocessor or Main P.C.B. with new one, reset Timer Microprocessor.

11.4. Analog Timer Block Diagram

12. Schematic Diagram

12.1. Interconnection Schematic Diagram

12.2. Main Power Supply Section Schematic Diagram

12.3. Sub Power Section (Main P.C.B. (1/31)) Schematic Diagram (P)

12.4. A/V I/O (1/4) Section (Main P.C.B. (2/3)) Schematic Diagram (A)

12.5. A/V I/O (2/4) Section (Main P.C.B. (2/3)) Schematic Diagram (A)

12.6. A/V I/O (3/4) Section (Main P.C.B. (2/3)) Schematic Diagram (A)

12.7. A/V I/O (4/4) Section (Main P.C.B. (2/3)) Schematic Diagram (A)

12.8. Timer (1/4) Section (Main P.C.B. (3/3)) Schematic Diagram (FL)

12.9. Timer (2/4) Section (Main P.C.B. (3/3)) Schematic Diagram (FL)

12.10. Timer (3/4) Section (Main P.C.B. (3/3)) Schematic Diagram (FL)

12.11. Timer (4/4) Section (Main P.C.B. (3/3)) Schematic Diagram (FL)

12.12. Front (L) Schematic Diagram

12.13. DV Jack Schematic Diagram

13. Printed Circuit Board

13.1. Power P.C.B.

13.2. Main P.C.B.

13.2.1. Main P.C.B. (1/4 Section)

13.2.2. Main P.C.B. (2/4 Section)

13.2.3. Main P.C.B. (3/4 Section)

13.2.4. Main P.C.B. (4/4 Section)

13.2.5. Main P.C.B. Address Information

13.3. Front (L) P.C.B.

13.4. DV Jack P.C.B.

14. Appendix for Schematic Diagram

14.1. Voltage and Waveform Chart

Note)

Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point, because it may differ from an actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

14.1.1. Power P.C.B.

14.1.2. Main P.C.B.

14.1.3. P59001 Connector

14.2. Waveform Chart

14.3. Abbreviations

			INITIAL/LOGO		ABBREVIATIONS	
			C	CAV	CONSTANT ANGULAR	
				CBDO	VELOCITY	
				CD	CAP. BLACK DROP OUT	
				CDSCK	COMPACT DISC	
				CDSRDATA	CD SERIAL DATA CLOCK	
					CD SERIAL DATA	
				CDRF	CD RF (EFM) SIGNAL	
				CDV	COMPACT DISC-VIDEO	
				CHNDATA	CHANNEL DATA	
				CKSL	SYSTEM CLOCK SELECT	
				CLV	CONSTANT LINEAR VELOCITY	
				COFTR	CAP. OFF TRACK	
				CPA	CPU ADDRESS	
				CPCS	CPU CHIP SELECT	
				CPDT	CPU DATA	
				CPUADR	CPU ADDRESS LATCH	
				CPUADT	CPU ADDRESS DATA BUS	
				CPUIRQ	CPU INTERRUPT REQUEST	
				CPRD	CPU READ ENABLE	
				CPWR	CPU WRITE ENABLE	
			CS	CHIP SELECT		
			CSYNCIN	COMPOSITE SYNC IN		
			CSYNCOUT	COMPOSITE SYNC OUT		
			D	DACCK	D/A CONVERTER CLOCK	
				DEEMP	DEEMPHASIS BIT ON/OFF	
				DEMPH	DEEMPHASIS SWITCHING	
				DIG0~UP	FL DIGIT OUTPUT	
				DIN	DATA INPUT	
				DMSRCK	DM SERIAL DATA READ CLOCK	
				DMUTE		
				DO	DIGITAL MUTE CONTROL	
				DOUT0~UP	DROP OUT	
					DATA OUTPUT	
				DRF	DATA SLICE RF (BIAS)	
				DRPOUT	DROP OUT SIGNAL	
				DREQ	DATA REQUEST	
				DRESP	DATA RESPONSE	
				DSC	DIGITAL SERVO CONTROLLER	
				DSLIF	DATA SLICE LOOP FILTER	
				DVD	DIGITAL VIDEO DISC	

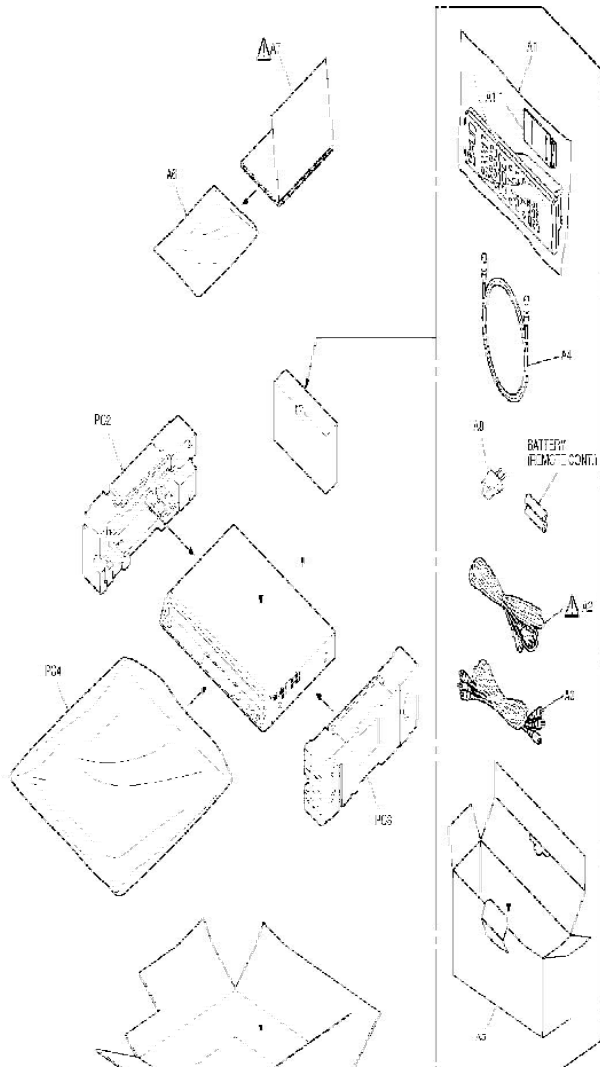
INITIAL/LOGO		ABBREVIATIONS
R	RE	READ ENABLE
	RFENV	RF ENVELOPE
	RFO	RF PHASE DIFFERENCE
	RS	OUTPUT
	RSEL	(CD-ROM) REGISTER SELECT
	RST	RF POLARITY SELECT
	RSV	RESET
S		RESERVE
	SBI0, 1	SERIAL DATA INPUT
	SBO0	SERIAL DATA OUTPUT
	SBT0, 1	SERIAL CLOCK
	SCK	SERIAL DATA CLOCK
	SCKR	AUDIO SERIAL CLOCK
	SCL	RECEIVER
	SCLK	SERIAL CLOCK
	SDA	SERIAL CLOCK
	SEG0~UP	SERIAL DATA
	SELCLK	FL SEGMENT OUTPUT
	SEN	SELECT CLOCK
	SIN1, 2	SERIAL PORT ENABLE
	SOUT1, 2	SERIAL DATA IN
	SPDI	SERIAL DATA OUT
	SPDO	SERIAL PORT DATA INPUT
	SPEN	SERIAL PORT DATA OUTPUT
	SPRCLK	SERIAL PORT R/W ENABLE
	SPWCLK	SERIAL PORT READ CLOCK
	SQCK	SERIAL PORT WRITE CLOCK
	SQCX	SUB CODE Q CLOCK
	SRDATA	SUB CODE Q DATA READ
	SRMADR	CLOCK
	SRMDT0~7	SERIAL DATA
		SRAM ADDRESS BUS
	SS	SRAM DATA BUS 0~7
	STAT	START/STOP
	STCLK	STATUS
	STD0~UP	STREAM DATA CLOCK
	STENABLE	STREAM DATA
		STREAM DATA INPUT ENABLE
	STSEL	STREAM DATA POLARITY
	STVALID	SELECT
	SUBC	STREAM DATA VALIDITY
	SBCK	SUB CODE SERIAL
	SUBQ	SUB CODE CLOCK
	SYSCLK	SUB CODE Q DATA
		SYSTEM CLOCK
INITIAL/LOGO		ABBREVIATIONS
T	TE	TRACKING ERROR
	TIBAL	BALANCE CONTROL
	TID	BALANCE OUTPUT 1
	TIN	BALANCE INPUT
	TIP	BALANCE INPUT
	TIS	BALANCE OUTPUT 2
	TPSN	OP AMP INPUT
	TPSO	OP AMP OUTPUT
	TPSP	OP AMP INVERTED INPUT
	TRCRS	TRACK CROSS SIGNAL
	TRON	TRACKING ON
	TRSON	TRAVERSE SERVO ON

INITIAL/LOGO	ABBREVIATIONS
V	VBLANK V BLANKING VCC COLLECTOR POWER SUPPLY VOLTAGE VCDCONT VIDEO CD CONTROL (TRACKING BALANCE) VDD DRAIN POWER SUPPLY VOLTAGE VFB VIDEO FEED BACK VOLTAGE REFERENCE VREF SOURCE POWER SUPPLY VOLTAGE VSS
W	WAIT BUS CYCLE WAIT WDCK WORD CLOCK WEH WRITE ENABLE HIGH WSR WORD SELECT RECEIVER
X	X X' TAL XALE X ADDRESS LATCH ENABLE XAREQ X AUDIO DATA REQUEST XCDROM X CD ROM CHIP SELECT XCS X CHIP SELECT XCSYNC X COMPOSITE SYNC XDS X DATA STROBE XHSYNCO X HORIZONTAL SYNC OUTPUT XHINT XH INTERRUPT REQUEST XI X' TAL OSCILLATOR INPUT XINT X INTERRUPT XMW X MEMORY WRITE ENABLE XO X' TAL OSCILLATOR OUTPUT XRE X READ ENABLE XSRMCE X SRAM CHIP ENABLE XSRMOE X SRAM OUTPUT ENABLE XSRMWE X SRAM WRITE ENABLE XVCS X V-DEC CHIP SELECT XVDS X V-DEC CONTROL BUS STROBE XVSYNCO X VERTICAL SYNC OUTPUT

15. Parts and Exploded Views

15.1. Exploded Views

15.1.1. Casing Parts & Mechanism Section



15.2. Replacement Parts List

Notes:

*Important safety notice:

Components identified by  mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.

*Warning: This product uses a laser diode. Refer to caution statements.

*Capacity values are in microfarads ( F) unless specified otherwise, P=Pico-farads (pF), F=Farads (F).

*Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).

*The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

*“(IA)”, marks in Remarks indicate languages of instruction manuals. [(IA): Spanish]

*Parts indicated with PAVC-CSG in the Remarks column are supplied by PAVC-CSG.

*All parts except parts indicated with (PAVC-CSG) in the Remarks column are supplied by PAVCSG.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
■	VEP70135A	FRONT(L) P.C.B.		(RTL)
S7002	EVQ11A04M	SWITCH,POWER	1	
■	VEP73135A	DV JACK P.C.B.		(RTL)
P37001	K1KA06B00181	CONNECTOR(6P)	1	
P37002	K2HZ104B0012	CONNECTOR(104P)	1	
■	RFKB79116D	MAIN P.C.B.		(RTL)
B7501	CR2354-1GUFE	BATTERY	1	
C1504	F2A1C1210017	16V 120P	1	
C1505	F2A1A6810022	10V 680P	1	
C1509	F1H1A105A028	10V 1U	1	
C1510	F1H1A105A028	10V 1U	1	
C1511	ECJ1VB1H103K	50V 0.01U	1	
C1512	F2A0J6810007	6.3V 680P	1	
C1513	F1J0J106A014	6.3V 10U	1	
C1518	F1H1A105A028	10V 1U	1	
C1519	F2A1A470A388	10V 47U	1	
C1521	F1H1A105A028	10V 1U	1	
C1522	F1H1A105A028	10V 1U	1	
C1523	F2A1A470A388	10V 47U	1	
C1524	F2A1A101A389	10V 100U	1	
C1525	ECJ1VB1C104K	16V 0.1U	1	
C1526	F1H1A105A028	10V 1U	1	
C1527	F1H1A105A028	10V 1U	1	
C1528	ECJ1VB1H103K	50V 0.01U	1	
C1539	F1H1A105A028	10V 1U	1	
C1541	F2A1E1010099	25V 100P	1	
C1550	ECJ1VB1H103K	50V 0.01U	1	
C3001	ECJ1VB1C104K	16V 0.1U	1	
C3002	ECJ1VB1C333K	16V 0.033U	1	
C3003	ECJ1VB1C104K	16V 0.1U	1	
C3007	ECJ1VB1H103K	50V 0.01U	1	
C3008	ECJ1VB1H103K	50V 0.01U	1	
C3009	ECJ1VB1H103K	50V 0.01U	1	
C3010	F2A1H220A236	50V 22	1	
C3011	ECJ1VB1H103K	50V 0.01U	1	
C3012	ECJ1VB1C104K	16V 0.1U	1	
C3013	F2J1C4700005	16V 47U	1	
C3014	ECJ1VB1C104K	16V 0.1U	1	
C3015	ECJ1VB1H103K	50V 0.01U	1	
C3016	ECJ1VB1H103K	50V 0.01U	1	
C3017	ECJ1VB1H103K	50V 0.01U	1	
C3018	ECJ1VB1H103K	50V 0.01U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C3019	F2A1H100A150	50V 10U	1	
C3020	ECJ1VB1C104K	16V 0.1U	1	
C3021	ECJ1VB1H103K	50V 0.01U	1	
C3022	F2J1C4700005	16V 47U	1	
C3023	ECJ1VB1H103K	50V 0.01U	1	
C3024	ECJ1VB1H103K	50V 0.01U	1	
C3025	ECJ1VB1H103K	50V 0.01U	1	
C3026	ECJ1VB1C104K	16V 0.1U	1	
C3027	F2A1E4700048	25V 47U	1	
C3028	ECJ1VB1H103K	50V 0.01U	1	
C3029	ECJ1VB1H103K	50V 0.01U	1	
C3030	ECJ1VB1H103K	50V 0.01U	1	
C3031	ECJ1VB1H103K	50V 0.01U	1	
C3032	F2A1E4700048	25V 47U	1	
C3033	F2A0J471A247	6.3V 470U	1	
C3034	F2A1E470A205	25V 47U	1	
C3035	F2A0J331A247	6.3V 330U	1	
C3036	F2A0J331A247	6.3V 330U	1	
C3037	F2A1E470A205	25V 47U	1	
C3038	F2A0J471A247	6.3V 470U	1	
C3039	F2A1E470A205	25V 47U	1	
C3040	F2A0J471A247	6.3V 470U	1	
C3041	ECJ1VB1H103K	50V 0.01U	1	
C3042	ECJ1VB1H103K	50V 0.01U	1	
C3901	ECJ1VB1H103K	50V 0.01U	1	
C3902	ECJ1VB1H103K	50V 0.01U	1	
C3903	ECJ1VB1C104K	16V 0.1U	1	
C3904	ECJ1VB1C104K	16V 0.1U	1	
C3905	ECJ1VB1H103K	50V 0.01U	1	
C3907	ECJ1VB1C104K	16V 0.1U	1	
C3908	ECJ1VB1H103K	50V 0.01U	1	
C4001	F2A1H1R0A236	50V 1U	1	
C4002	F2A1H1R0A236	50V 1U	1	
C4003	F2A1H1R0A236	50V 1U	1	
C4004	F2A1H1R0A236	50V 1U	1	
C4005	ECJ1VB1C105K	16V 1U	1	
C4006	ECJ1VB1C105K	16V 1U	1	
C4007	ECJ2VB1E104K	25V 0.1U	1	
C4008	ECJ1VF1C104Z	16V 0.1U	1	
C4011	ECJ1VF1C104Z	16V 0.1U	1	
C4012	F2A1C221A019	16V 220U	1	
C4013	ECJ1VC1H121J	50V 120P	1	
C4014	ECJ1VC1H121J	50V 120P	1	
C4015	ECJ1VC1H102J	50V 1000P	1	
C4016	ECJ1VC1H102J	50V 1000P	1	
C4017	ECJ1VF1C104Z	16V 0.1U	1	
C4018	F2A1C471A236	16V 470U	1	
C4019	F2A1H1R0A236	50V 1U	1	
C4020	F2A1H1R0A236	50V 1U	1	
C4021	F2A1E470A205	25V 47U	1	
C4022	F2A1E470A205	25V 47U	1	
C4023	F2A1C100A019	16V 10U	1	
C4024	F2A1C100A019	16V 10U	1	
C4025	F2A1E470A205	25V 47U	1	
C4026	F2A1E470A205	25V 47U	1	
C4029	ECJ1VC1H102J	50V 1000P	1	
C4030	ECJ1VC1H102J	50V 1000P	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C4031	F2A0J471A247	6.3V 470U	1	
C4033	ECQV1H104JL3	50V 0.1U	1	
C4034	ECJ1VF1C104Z	16V 0.1U	1	
C4035	ECJ1VF1C104Z	16V 0.1U	1	
C4036	ECQV1H104JL3	50V 0.1U	1	
C4904	F2A0J470A599	6.3V 47U	1	
C4905	ECJ1VF1C104Z	16V 0.1U	1	
C7403	ECJ1VB1C104K	16V 0.1U	1	
C7404	ECJ1VB1H102K	50V 1000P	1	
C7504	ECJ1VC1H101J	50V 100P	1	
C7505	ECJ1VC1H101J	50V 100P	1	
C7506	ECJ1VC1H101J	50V 100P	1	
C7507	ECJ1VB1H103K	50V 0.01U	1	
C7508	ECJ1VB1H103K	50V 0.01U	1	
C7509	ECJ1VB1H103K	50V 0.01U	1	
C7512	ECJ1VC1H240J	50V 24	1	
C7513	ECJ1VC1H270J	50V 27P	1	
C7514	ECJ1VB1C104K	16V 0.1U	1	
C7516	ECJ1VB1C104K	16V 0.1U	1	
C7519	ECJ1VB1C104K	16V 0.1U	1	
C7521	ECJ1VC1H101J	50V 100P	1	
C7522	F2A0J470A245	6.3V 47U	1	
C7523	F1H1A105A028	10V 1U	1	
C7524	F2A1H100A820	50V 10P	1	
C7525	ECJ1VF1A105Z	10V 1U	1	
C7527	F2A1C221A877	16V 220P	1	
C7530	F2A1C221A877	16V 220P	1	
C7531	ECQB1H392KF3	50V 3900P	1	
C7532	F2A1V470A654	35V 47P	1	
C7533	F2A1H100A820	50V 10P	1	
C7534	ECJ1VB0J105K	6.3V 1U	1	
C7535	ECJ1VB1H103K	50V 0.01U	1	
C7538	F2A0J471A574	6.3V 470U	1	
C7561	ECJ1VB1C104K	16V 0.1U	1	
C7805	ECJ1VC1H270J	50V 27P	1	
C7823	F2A0J470A245	6.3V 47U	1	
C7824	ECJ1VB1H103K	50V 0.01U	1	
C7825	F2A1H1R0A234	50V 1U	1	
C7826	ECJ1VB1H103K	50V 0.01U	1	
C7827	F1H1H470A799	50V 47P	1	
C7828	F1H1H470A799	50V 47P	1	
C7829	ECJ1VB1H103K	50V 0.01U	1	
C7830	F2A0J470A245	6.3V 47U	1	
C8001	F1H1H220A799	50V 22P	1	
C8002	F1H1H220A799	50V 22P	1	
C8003	ECJ1VB1C104K	16V 0.1U	1	
C8004	ECJ1VC1H101J	50V 100P	1	
C8006	ECJ1VB1C104K	16V 0.1U	1	
C8007	ECJ1VB1C104K	16V 0.1U	1	
C8008	ECJ1VB1C104K	16V 0.1U	1	
C8010	ECJ1VC1H101J	50V 100P	1	
C8013	ECJ1VF1A105Z	10V 1U	1	
D4001	MA2C165001VT	DIODE	1	
D4003	MA3Z142D0LG	DIODE	1	
D7401	B0JACE000001	DIODE	1	
D7502	MA2C165001VT	DIODE	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
D7504	MAZ4180NHF	DIODE	1	
D7506	B0JAMD000026	DIODE	1	
D7507	B0AADM000003	DIODE	1	
D7508	B0AADM000003	DIODE	1	
D7509	B0JACE000001	DIODE	1	
D7510	B0JDCE000002	DIODE	1	
D7511	MAZ4220NLF	DIODE	1	
D7512	B0BA03600021	DIODE	1	
D7801	B0BA03000015	DIODE	1	
DP7501	A2BD00000144	DISPLAY TUBE	1	
IC1502	C0CBCDD00027	IC	1	
IC1504	C0DBGHF00001	IC	1	
IC1505	C0CBCDC00052	IC	1	
IC1506	C0DAEYH00002	IC	1	
IC1507	C0CBCBD00048	IC	1	
IC3001	C1AB00001979	IC	1	
IC4001	C1AB00001920	IC	1	
IC4002	C0DBAHD00013	IC	1	
IC4003	C0CBCDC00027	IC	1	
IC4901	B3ZAZ0000016	IC	1	
IC7401	RFKFM6016K	IC	1	(PAVC-CSG)
IC7404	C0BBB0000014	IC	1	
IC7501	MN67789RA	IC	1	
IC7502	C0EBE0000194	IC	1	
IC7514	C0EBJ0000336	IC	1	
IP1501	K5H302100004	IC PROTECTOR	1	
IP7501	K5H7512A0010	IC PROTECTOR	1	
IR7501	PNA4618M09VT	REMOTE SENSOR	1	
JK3901	K2HE110B0001	JACK	1	
JK3902	K2HE109B0001	JACK	1	
JK3903	K2HA304B0007	JACK,COMPONENT VIDEO OUT	1	
JK3905	K2HE1YYB0002	JACK	1	
JW7501	VWJ02F0060VV	FRONT(L)WIRE	1	
K7502	ERJ3GEY0R00V	1/10W 0	1	
K7503	ERJ3GEY0R00V	1/10W 0	1	
K7511	ERJ3GEY0R00V	1/10W 0	1	
K7513	ERJ3GEY0R00V	1/10W 0	1	
K7517	ERJ3GEY0R00V	1/10W 0	1	
K7518	ERJ3GEY0R00V	1/10W 0	1	
K7520	ERJ3GEY0R00V	1/10W 0	1	
K7702	ERJ6GEY0R00V	1/8W 0	1	
K7801	ERJ3GEY0R00V	1/10W 0	1	
K7802	ERJ3GEY0R00V	1/10W 0	1	
L1504	G0A100ZA0041	COIL 10UH	1	
L3001	G0C220JA0019	COIL 22UH	1	
L3002	G0C220JA0019	COIL 22UH	1	
L7501	G0C390JA0055	COIL 39UH	1	
L7503	G0C220JA0019	COIL 22UH	1	



Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
LB1502	J0JHC0000048	FILTER	1	
LB1503	J0JHC0000048	FILTER	1	
LB1505	J0JHC0000048	FILTER	1	
LB1506	J0JHC0000048	FILTER	1	
LB3911	J0JGC0000020	COIL	1	
LB3912	J0JCC0000103	COIL	1	
LB3913	J0JCC0000103	COIL	1	
LB3914	J0JCC0000103	COIL	1	
LB3915	J0JCC0000103	COIL	1	
LB3916	J0JCC0000103	COIL	1	
LB3917	J0JGC0000020	COIL	1	
LB4901	J0JHC0000032	COIL	1	
LB4911	J0JCC0000103	COIL	1	
LB4912	J0JCC0000103	COIL	1	
LB4913	J0JCC0000103	COIL	1	
LB4914	J0JCC0000103	COIL	1	
LB7401	J0JHC0000048	FILTER	1	
LB7402	J0JHC0000048	FILTER	1	
LB7403	J0JGC0000020	COIL	1	
LB7404	J0JCC0000103	COIL	1	
LB7405	J0JCC0000103	COIL	1	
LB7406	J0JGC0000020	COIL	1	
LB7407	J0JGC0000020	COIL	1	
LB7409	J0JHC0000048	FILTER	1	
LB7410	J0JHC0000048	FILTER	1	
LB7501	ERJ3GEY0R00V	1/10W 0	1	
LB7503	ERJ3GEY0R00V	1/10W 0	1	
LB7504	ERJ3GEY0R00V	1/10W 0	1	
LB7801	J0JHC0000032	COIL	1	
LB7802	J0JHC0000032	COIL	1	
LB8001	ERJ3GEY0R00V	1/10W 0	1	
P1501	K1KA23A00003	CONNECTOR(23P)	1	
P7401	K1KY64A00001	CONNECTOR(64P)	1	
Q1501	B1DHED000008	TRANSISTOR	1	
Q4003	2SD132800L	TRANSISTOR	1	
Q4004	2SD132800L	TRANSISTOR	1	
Q7401	B1CFHC000003	TRANSISTOR	1	
Q7402	B1CFHC000003	TRANSISTOR	1	
Q7501	2SD132800L	TRANSISTOR	1	
Q7502	B1BABK000001	TRANSISTOR	1	
Q7503	2SD0601A0L	TRANSISTOR	1	
Q7504	2SD0601A0L	TRANSISTOR	1	
Q7510	2SD0601A0L	TRANSISTOR	1	
Q7511	2SD0601A0L	TRANSISTOR	1	
Q7513	B1CFHC000003	TRANSISTOR	1	
Q7514	2SD0601A0L	TRANSISTOR	1	
Q7801	B1ADCF000154	TRANSISTOR	1	
QR1501	UNR521300L	TRANSISTOR	1	
QR1502	UNR521300L	TRANSISTOR	1	
QR4001	UNR521100L	TRANSISTOR	1	
QR4002	UNR511100L	TRANSISTOR	1	
QR4003	UNR521100L	TRANSISTOR	1	
QR7501	UNR511300L	TRANSISTOR	1	
QR7502	UNR521200L	TRANSISTOR	1	

GROUP	STRUCTURE	TRANSITION	.	
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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
QR7503	UNR511300L	TRANSISTOR	1	
R1503	ERJ3GEYJ471V	1/10W 470	1	
R1509	ERJ3RBD393V	1/16W 39K	1	
R1510	ERJ3RBD152V	1/16W 1.5K	1	
R1511	ERJ3RBD113V	1/16W 11K	1	
R1518	ERJ3GEYJ472V	1/10W 4.7K	1	
R1519	ERJ3GEYJ472V	1/10W 4.7K	1	
R1522	ERJ3GEYJ223V	1/10W 22K	1	
R3001	ERJ3GEYJ105V	1/10W 1M	1	
R3002	ERJ3GEYJ750V	1/10W 75	1	
R3004	ERJ3GEYJ221V	1/10W 220	1	
R3005	ERJ3GEYJ221V	1/10W 220	1	
R3006	ERJ3RBD153V	1/16W 15K	1	
R3007	ERJ3RBD104V	1/16W 100K	1	
R3009	ERJ3GEYJ103V	1/10W 10K	1	
R3010	ERJ3GEYJ103V	1/10W 10K	1	
R3011	ERJ3GEYJ103V	1/10W 10K	1	
R3012	ERJ3RBD472V	1/16W 4.7K	1	
R3013	ERJ3RBD472V	1/16W 4.7K	1	
R3014	ERJ3RBD472V	1/16W 4.7K	1	
R3015	ERJ3RBD472V	1/16W 4.7K	1	
R3016	ERJ3RBD472V	1/16W 4.7K	1	
R3901	ERJ3GEYJ750V	1/10W 75	1	
R3902	ERJ3GEYJ750V	1/10W 75	1	
R3903	ERJ3GEYJ102V	1/10W 1K	1	
R3904	ERJ3GEYJ102V	1/10W 1K	1	
R3905	ERJ3GEYJ750V	1/10W 75	1	
R3906	ERJ3GEYJ750V	1/10W 75	1	
R3907	ERJ3GEYJ750V	1/10W 75	1	
R3908	ERJ3GEYJ750V	1/10W 75	1	
R3909	ERJ3GEYJ912V	1/10W 9.1K	1	
R3911	ERJ3GEYJ750V	1/10W 75	1	
R3913	ERJ3GEYJ750V	1/10W 75	1	
R3914	ERJ3GEYJ750V	1/10W 75	1	
R3918	ERJ3GEYJ750V	1/10W 75	1	
R3919	ERJ3GEYJ750V	1/10W 75	1	
R3920	ERJ3GEYJ750V	1/10W 75	1	
R3926	ERJ3GEYJ102V	1/10W 1K	1	
R3927	ERJ3GEYJ750V	1/10W 75	1	
R3928	ERJ3GEYJ750V	1/10W 75	1	
R3929	ERJ3GEYJ750V	1/10W 75	1	
R4001	ERJ3GEYJ104V	1/10W 100K	1	
R4002	ERJ3GEYJ104V	1/10W 100K	1	
R4003	ERJ3GEYJ102V	1/10W 1K	1	
R4004	ERJ3GEYJ102V	1/10W 1K	1	
R4005	ERJ3GEYJ102V	1/10W 1K	1	
R4006	ERJ3GEYJ102V	1/10W 1K	1	
R4009	ERJ3GEY0R00V	1/10W 0	1	
R4010	ERJ3GEY0R00V	1/10W 0	1	
R4011	ERJ3GEYJ104V	1/10W 100K	1	
R4012	ERJ3GEYJ104V	1/10W 100K	1	
R4013	ERJ3GEYJ101V	1/10W 100	1	
R4014	ERJ3GEYJ101V	1/10W 100	1	
R4015	D0HB153ZA002	1/10W 15K	1	
R4016	D0HB561ZA002	1/10W 560	1	
R4017	D0HB561ZA002	1/10W 560	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R4018	D0HB153ZA002	1/10W 15K	1	
R4019	ERJ3GEYJ102V	1/10W 1K	1	
R4020	ERJ3GEYJ102V	1/10W 1K	1	
R4021	D0HB103ZA002	1/10W 10K	1	
R4022	D0HB103ZA002	1/10W 10K	1	
R4023	ERJ3GEYJ104V	1/10W 100K	1	
R4024	ERJ3GEYJ104V	1/10W 100K	1	
R4025	D0HB622ZA002	1/16W 6.2K	1	
R4026	D0HB622ZA002	1/16W 6.2K	1	
R4027	D0HB392ZA002	1/16W 3.9K	1	
R4028	D0HB392ZA002	1/16W 3.9K	1	
R4029	ERJ3GEYJ103V	1/10W 10K	1	
R4030	ERJ3GEYJ473V	1/10W 47K	1	
R4031	ERJ3GEYJ473V	1/10W 47K	1	
R4032	ERJ3GEYJ681V	1/10W 680	1	
R4037	ERJ3GEYJ681V	1/10W 680	1	
R4038	ERJ3GEYJ272V	1/10W 2.7K	1	
R4039	ERJ3GEYJ272V	1/10W 2.7K	1	
R4040	ERJ3GEYJ221V	1/10W 220	1	
R4043	ERJ3GEYJ221V	1/10W 220	1	
R4901	ERJ3GEY0R00V	1/10W 0	1	
R4902	ERJ3GEY0R00V	1/10W 0	1	
R7401	ERJ3GEY0R00V	1/10W 0	1	
R7402	ERJ3GEYJ472V	1/10W 4.7K	1	
R7403	ERJ3GEYJ472V	1/10W 4.7K	1	
R7404	ERJ3GEY0R00V	1/10W 0	1	
R7406	ERJ3GEYJ472V	1/10W 4.7K	1	
R7439	ERJ3GEYJ223V	1/10W 22K	1	
R7501	ERJ3GEYJ473V	1/10W 47K	1	
R7502	ERJ3GEYJ473V	1/10W 47K	1	
R7504	ERJ3GEY0R00V	1/10W 0	1	
R7505	ERJ3GEY0R00V	1/10W 0	1	
R7506	ERJ3GEYJ822V	1/10W 8.2K	1	
R7507	ERJ3GEYJ473V	1/10W 47K	1	
R7508	ERJ3GEYJ473V	1/10W 47K	1	
R7509	ERJ3GEYJ473V	1/10W 47K	1	
R7510	ERJ3GEYJ822V	1/10W 8.2K	1	
R7513	ERJ3GEYJ472V	1/10W 4.7K	1	
R7514	ERJ3GEYJ101V	1/10W 100	1	
R7515	ERJ3GEYJ101V	1/10W 100	1	
R7516	ERJ3GEYJ101V	1/10W 100	1	
R7517	ERJ3GEYJ822V	1/10W 8.2K	1	
R7518	ERJ3GEYJ101V	1/10W 100	1	
R7519	ERJ3GEYJ101V	1/10W 100	1	
R7520	ERJ3GEYJ101V	1/10W 100	1	
R7521	ERJ3GEYJ101V	1/10W 100	1	
R7522	ERJ3GEYJ101V	1/10W 100	1	
R7523	ERJ3GEYJ101V	1/10W 100	1	
R7524	ERJ3GEYJ101V	1/10W 100	1	
R7525	ERJ3GEYJ103V	1/10W 10K	1	
R7526	ERJ3GEYJ472V	1/10W 4.7K	1	
R7527	ERJ3GEYJ472V	1/10W 4.7K	1	
R7528	ERJ3GEYJ472V	1/10W 4.7K	1	
R7533	ERJ3GEYJ104V	1/10W 100K	1	
R7534	ERJ3GEYJ223V	1/10W 22K	1	
R7535	ERJ3GEYJ101V	1/10W 100	1	
R7536	ERJ3GEYJ473V	1/10W 47K	1	

1999	2000-2001	2002-2003	.	
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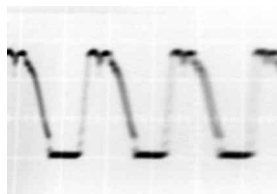
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R7541	ERJ3GEYJ101V	1/10W 100	1	
R7543	ERJ3GEYJ103V	1/10W 10K	1	
R7545	ERDS2TJ271T	1/4W 270	1	
R7548	ERJ3GEYJ103V	1/10W 10K	1	
R7549	ERJ3GEYJ473V	1/10W 47K	1	
R7550	ERJ3GEYJ562V	1/10W 5.6K	1	
R7551	ERJ3GEYJ470V	1/10W 47	1	
R7552	ERJ3GEYJ473V	1/10W 47K	1	
R7553	ERJ3GEYJ473V	1/10W 47K	1	
R7554	ERJ3GEYJ473V	1/10W 47K	1	
R7555	ERJ3GEYJ153V	1/10W 15K	1	
R7558	ERJ3GEYJ103V	1/10W 10K	1	
R7559	ERJ3GEYJ103V	1/10W 10K	1	
R7560	ERJ3GEYJ102V	1/10W 1K	1	
R7561	ERJ3GEY0R00V	1/10W 0	1	
R7562	ERJ3GEYJ472V	1/10W 4.7K	1	
R7563	ERJ3GEYJ101V	1/10W 100	1	
R7564	ERJ3GEYJ103V	1/10W 10K	1	
R7569	ERJ3GEYJ472V	1/10W 4.7K	1	
R7570	ERJ3GEYJ103V	1/10W 10K	1	
R7572	ERJ3GEYJ103V	1/10W 10K	1	
R7573	ERJ3GEYJ274V	1/10W 270K	1	
R7574	ERJ3GEYJ473V	1/10W 47K	1	
R7575	ERJ3GEYJ473V	1/10W 47K	1	
R7576	ERJ3GEYJ101V	1/10W 100	1	
R7582	ERJ3GEYJ473V	1/10W 47K	1	
R7584	ERJ3GEYJ101V	1/10W 100	1	
R7585	ERJ3GEYJ473V	1/10W 47K	1	
R7586	ERJ3GEYJ473V	1/10W 47K	1	
R7587	ERJ3GEYJ473V	1/10W 47K	1	
R7588	ERJ3GEY0R00V	1/10W 0	1	
R7589	ERJ3GEY0R00V	1/10W 0	1	
R7590	ERJ3GEYJ473V	1/10W 47K	1	
R7591	ERJ3GEYJ473V	1/10W 47K	1	
R7592	ERJ3GEYJ473V	1/10W 47K	1	
R7593	ERJ3GEYJ473V	1/10W 47K	1	
R7598	ERDS2TJ470T	1/4W 47	1	
R7599	ERJ3GEYJ473V	1/10W 47K	1	
R7600	ERJ3GEYJ272V	1/10W 2.7K	1	
R7601	ERJ3GEYJ272V	1/10W 2.7K	1	
R7603	ERJ3GEYJ562V	1/10W 5.6K	1	
R7604	ERJ3GEYJ163V	1/10W 16K	1	
R7605	ERJ3GEYJ562V	1/10W 5.6K	1	
R7801	J0JCC0000103	COIL	1	
R7802	J0JCC0000103	COIL	1	
R7812	ERDS2TJ102T	1/4W 1K	1	
R7814	ERJ3GEYJ681V	1/10W 680	1	
R7815	J0JCC0000103	COIL	1	
R7816	J0JCC0000103	COIL	1	
R8001	ERJ3GEYJ103V	1/10W 10K	1	
S7501	EVQ11A04M	SWITCH	1	
S7502	EVQ11A04M	SWITCH	1	
S7503	EVQ11A04M	SWITCH	1	
S7505	EVQ11A04M	SWITCH	1	
S7506	EVQ11A04M	SWITCH	1	
S7507	EVQ11A04M	SWITCH	1	

0.00	1.000000	0.000000	.	
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Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
T7501	G4D1A0000118	TRANSFORMER	1	
TU7801	ENGD6401DF	TV TUNERS	1	
W501	ERJ6GEY0R00V	1/8W 0	1	
W503	ERJ3GEY0R00V	1/10W 0	1	
W504	ERJ3GEY0R00V	1/10W 0	1	
W505	ERJ3GEY0R00V	1/10W 0	1	
W506	ERJ6GEY0R00V	1/8W 0	1	
W507	ERJ3GEY0R00V	1/10W 0	1	
W508	ERJ3GEY0R00V	1/10W 0	1	
W509	ERJ3GEY0R00V	1/10W 0	1	
W510	ERJ3GEY0R00V	1/10W 0	1	
W511	ERJ3GEY0R00V	1/10W 0	1	
W512	ERJ6GEY0R00V	1/8W 0	1	
W513	ERJ6GEY0R00V	1/8W 0	1	
W514	ERJ3GEY0R00V	1/10W 0	1	
W515	ERJ6GEY0R00V	1/8W 0	1	
W516	ERJ3GEY0R00V	1/10W 0	1	
W517	ERJ3GEY0R00V	1/10W 0	1	
W518	ERJ3GEY0R00V	1/10W 0	1	
W519	ERJ3GEY0R00V	1/10W 0	1	
W520	ERJ6GEY0R00V	1/8W 0	1	
W521	ERJ6GEY0R00V	1/8W 0	1	
W522	ERJ3GEY0R00V	1/10W 0	1	
W523	ERJ3GEY0R00V	1/10W 0	1	
W524	ERJ6GEY0R00V	1/8W 0	1	
W525	ERJ6GEY0R00V	1/8W 0	1	
W526	ERJ3GEY0R00V	1/10W 0	1	
W527	ERJ3GEY0R00V	1/10W 0	1	
W528	ERJ3GEY0R00V	1/10W 0	1	
W529	ERJ3GEY0R00V	1/10W 0	1	
W530	ERJ3GEY0R00V	1/10W 0	1	
X7502	H0A327200108	CRYSTAL OSCILLATOR	1	
X7503	EF0MC1005T4	OSCILLATOR	1	
		CASING/ACCESSORY/PACKING		
<u>1</u>	VEP70135A	FRONT(L) P.C.B.	1	(RTL)
<u>2</u>	VEP73135A	DV JACK P.C.B.	1	(RTL)
<u>3</u>	RFKB79116D	MAIN P.C.B.	1	(RTL)
<u>5</u>	RGR0365H-A1	REAR PANEL	1	
<u>6</u>	RHD30111-3J	SCREW	18	
<u>7</u>	RHD30119-L	SCREW	11	
<u>8</u>	RMA1979A	DIGITAL ANGLE (A)	1	
<u>9</u>	VMX1336	MINI CARD SPACER	1	
<u>10</u>	RMQ1513	HEAT TRANSFER SHEET	1	
<u>12</u>	RKA0144-K	FOOT RUBBER	4	
<u>13</u>	RMC0672	PLATE SPRING	1	
<u>14</u>	RMY0357	HEAT SINK	1	
<u>16</u>	VJF0036	NYLON RIVET	2	
<u>17</u>	XSN3+4FJ	SCREW	1	
<u>18</u>	RYP1310-S	FRONT PANEL ASS'Y 1	1	
<u>18-1</u>	RGK1968-Q	FL ORNAMENT	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
<u>18-2</u>	RGK1971A-S	REC BUTTON RING	1	
<u>18-3</u>	RYF0798A-S	PANEL DOOR ASS'Y	1	
<u>18-4</u>	RKF0751-K	TRAY DOOR	1	
<u>18-5</u>	VMB3410	TRAY SPRING	1	
<u>19</u>	RHD30113	SCREW	2	
<u>20</u>	XYN3+J8FJ	SCREW	1	
<u>21</u>	RKM0552-S	TOP CASE	1	
<u>23</u>	RMC0625	TUNER GND	2	
<u>24</u>	ETXMM620M2C	POWER SUPPLY P.C.B.	1	(RTL)
<u>25</u>	RMQ1566	GASKET	2	
<u>28</u>	RFKNES15PL	RAM/DIGITAL P.C.B. MODULE	1	(RTL)
<u>29</u>	VKC0295	RIVET	2	
<u>A1</u>	EUR7659Y10	REMOTE CONTROL ASS'Y	1	
<u>A1-1</u>	UR76EC5903A	BATTERY COVER	1	
<u>A2</u>	K2CQ2CA00002	AC CORD	1	
<u>A3</u>	K2KA6BA00003	AV CORD	1	
<u>A4</u>	K2KZ2BA00001	RF COAXIAL CABLE	1	
<u>A5</u>	RPQF0275	ACCESSORY BOX	1	
<u>A6</u>	RPFC0031-B	POLYETHYLENE BAG	1	
<u>A7</u>	RQT8316-1M	OPERATING INSTRUCTIONS	1	(IA)
<u>A8</u>	K2DA42E00001	POWER PLUG ADAPTOR	1	
<u>PC1</u>	RPG8005	PACKING CASE	1	
<u>PC2</u>	RPN1863A	CUSHION A	1	
<u>PC3</u>	RPN1863B	CUSHION B	1	
<u>PC4</u>	RPFC0026-B	POLYETHYLENE BAG	1	

16. Schematic Diagram for printing with A4



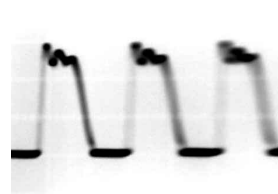
T001-B1 STOP
34Vp-p ($5\mu\text{sec.div}$)



T001-P1 STOP
220Vp-p ($5\mu\text{sec.div}$)



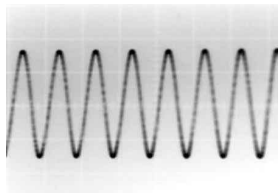
T001-S2A,S2B,S2C STOP
14Vp-p ($5\mu\text{sec.div}$)



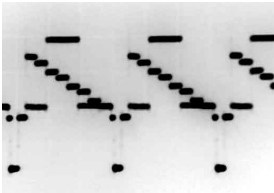
T001-S3 STOP
28Vp-p ($5\mu\text{sec.div}$)



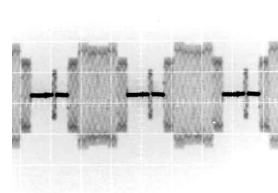
IC001-1 STOP
220Vp-p ($5\mu\text{sec.div}$)



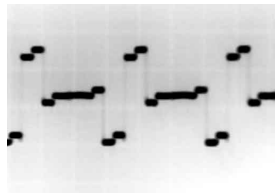
P7401-17,19 REC/PLAY
0.8Vp-p (1m sec.div)



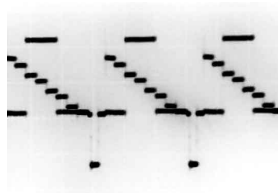
P7401-39 REC/PLAY
1.0Vp-p ($20\mu\text{sec.div}$)



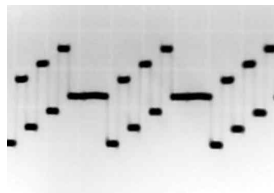
P7401-43 REC/PLAY
0.7Vp-p ($20\mu\text{sec.div}$)



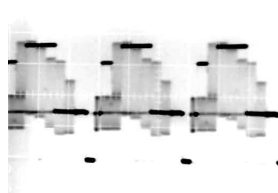
P7401-47 REC/PLAY
0.5Vp-p ($20\mu\text{sec.div}$)



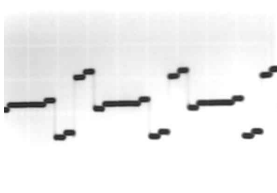
P7401-51 REC/PLAY
1.0Vp-p ($20\mu\text{sec.div}$)



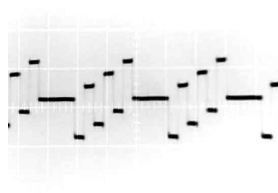
P7401-55 REC/PLAY
0.5Vp-p ($20\mu\text{sec.div}$)



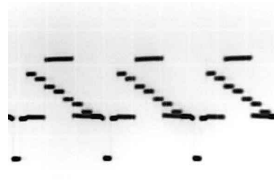
P7401-59 REC/PLAY
1.0Vp-p ($20\mu\text{sec.div}$)



JK3903-2 REC/PLAY
1.0Vp-p ($20\mu\text{sec.div}$)



JK3903-3 REC/PLAY
1.0Vp-p ($20\mu\text{sec.div}$)



JK3903-4 REC/PLAY
2.0Vp-p ($20\mu\text{sec.div}$)

Ref No. MODE	IC001							IC101											
	1	2	3	4	5			A	K	R									
REC	-50.7	-0.2	0	17.2	0.3			0	10.3	2.4									
PLAY	-50.7	-0.2	0	17.2	0.3			0	10.3	2.4									
STOP	-50.7	-0.2	0	17.2	0.3			0	10.3	2.4									
Ref No. MODE	IC102																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
REC	0	-	0	5.4	3.4	-	2.6	-	-	-	12.0	9.3	-	0.9	0.9	0			
PLAY	0	-	0	5.4	3.4	-	2.6	-	-	-	12.0	9.3	-	0.9	0.9	0			
STOP	0	-	0	5.4	3.4	-	2.6	-	-	-	12.0	9.3	-	0.9	0.9	0			

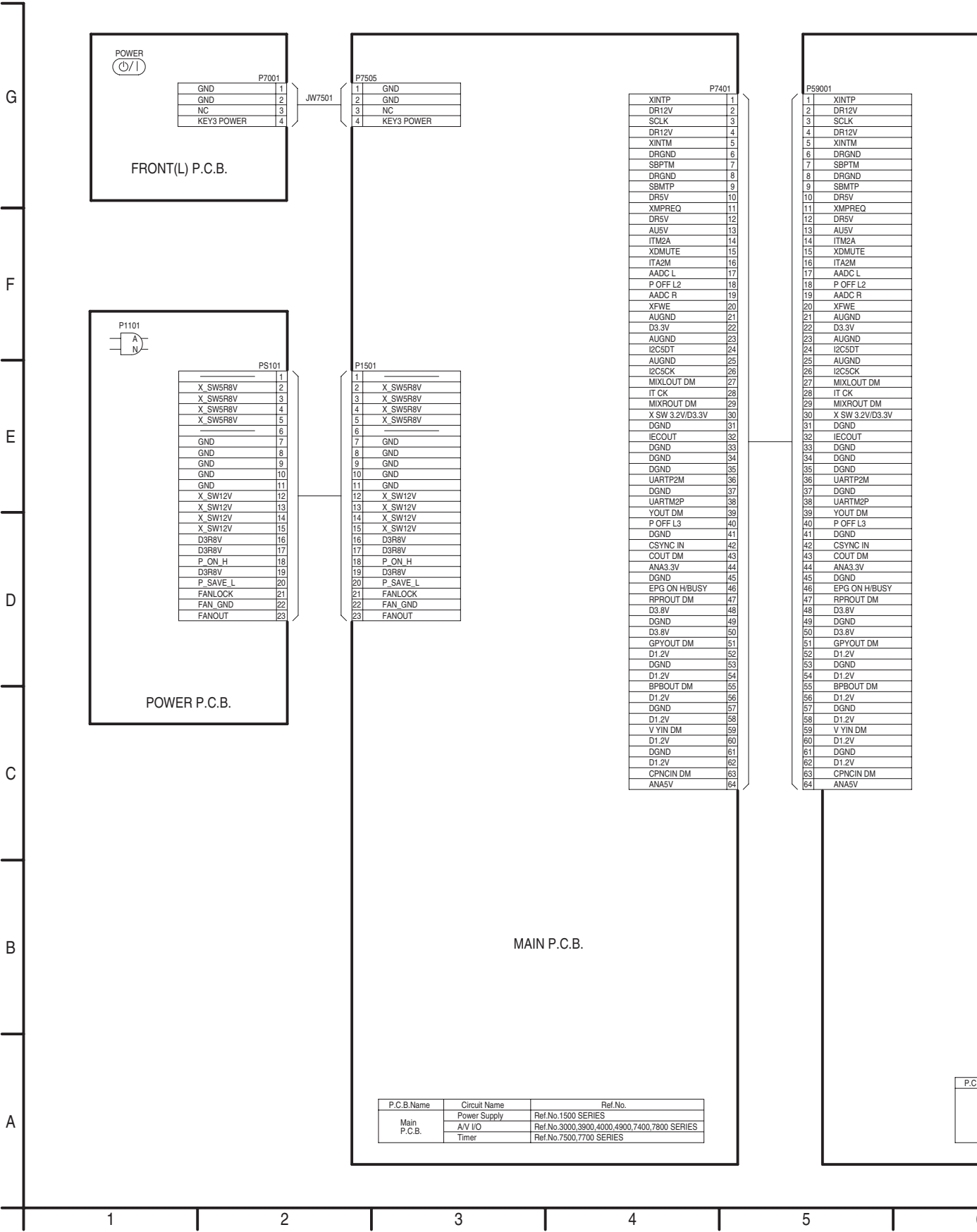
[illegible]

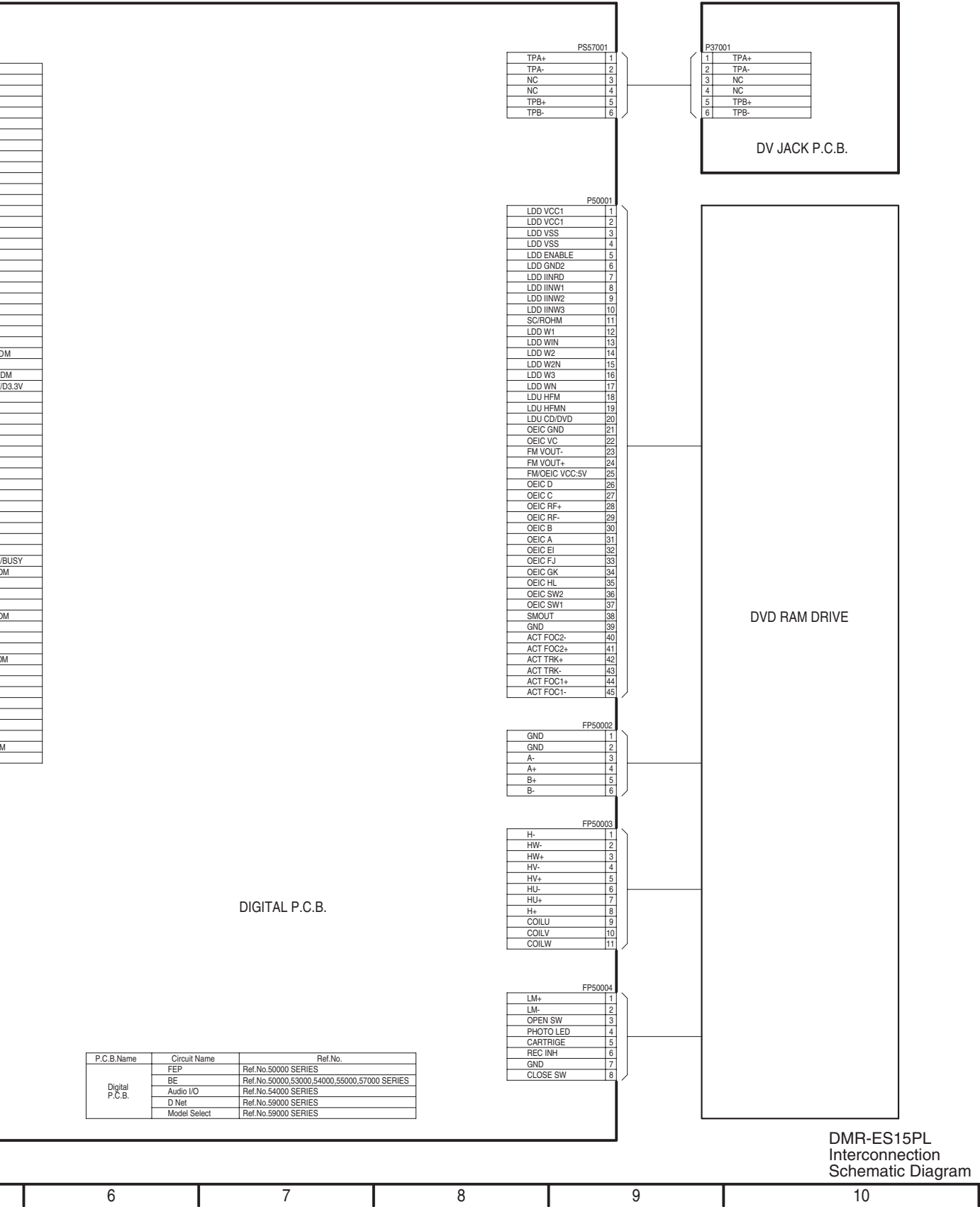
Ref No.	IC4001																							
	MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
REC	-	4.4	4.4	-	-	-	-	-	3.4	4.5	4.5	4.5	4.5	4.5	4.5	0	4.5	0	-	0	5.1			
PLAY	-	4.4	4.4	-	-	-	-	-	3.4	4.5	4.5	4.5	4.5	4.5	4.5	0	4.5	0	-	0	5.1			
STOP	-	4.4	4.4	-	-	-	-	-	3.4	4.5	4.5	4.5	4.5	4.5	4.5	0	4.5	0	-	0	5.1			
Ref No.	IC4001																							
	MODE	21	22	23	24	25	26	27	28	29	30	31	32											
REC	5.1	0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	9.0	4.5	4.5												
PLAY	5.1	0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	9.0	4.5	4.5												
STOP	5.1	0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	9.0	4.5	4.5												
Ref No.	IC4002								IC4003								IC4901							
	MODE	1	2	3	4	5		1	2	3	4	5		1	2	3								
REC	1.3	0	4.9	6.1	5.0		4.9	0	1.3	9.0	12.4		1.7	5.0	0									
PLAY	1.3	0	4.9	6.1	5.0		4.9	0	1.3	9.0	12.4		1.7	5.0	0									
STOP	1.3	0	4.9	6.1	5.0		4.9	0	1.3	9.0	12.4		1.7	5.0	0									
Ref No.	IC7401								IC7404															
	MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8						
REC	0	0	0	0	5.1	5.1	0	5.1		-	-	0	0	-	-	2.5	5.0							
PLAY	0	0	0	0	5.1	5.1	0	5.1		-	-	0	0	-	-	2.5	5.0							
STOP	0	0	0	0	5.1	5.1	0	5.1		-	-	0	0	-	-	2.5	5.0							
Ref No.	IC7501																							
	MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
REC	0	5.0	0	4.9	4.9	4.9	4.9	4.9	5.0	1.3	2.1	0	0.5	0.6	0	5.0	5.0	5.0	4.7	0				
PLAY	0	5.0	0	4.9	4.9	4.9	4.9	4.9	5.0	1.3	2.1	0	0.5	0.6	0	5.0	5.0	5.0	4.7	0				
STOP	0	5.0	0	4.9	4.9	4.9	4.9	4.9	5.0	1.3	2.1	0	0.5	0.6	0	5.0	5.0	5.0	4.7	0				
Ref No.	IC7501																							
	MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40			
REC	0	4.7	4.7	5.0	4.9	4.9	4.9	0.6	5.0	-	0	-	3.1	4.9	4.9	4.9	4.8	0	4.8	-				
PLAY	0	4.7	4.7	5.0	4.9	4.9	4.9	0.3	5.0	-	0	-	3.1	4.9	4.9	4.9	4.8	0	4.8	-				
STOP	0	4.7	4.7	5.0	4.9	4.9	4.9	0.6	5.0	-	0	-	3.1	4.9	4.9	4.9	4.8	0	4.8	-				
Ref No.	IC7501																							
	MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60			
REC	-	-18.1	-18.1	-18.1	-17.7	-17.7	-17.7	-17.7	-21.1	-21.1	-14.3	-17.6	-17.6	-17.6	-14.2	-14.2	-21.0	-21.0	-10.8	-17.6				
PLAY	-	-18.1	-18.1	-18.1	-17.7	-17.7	-17.7	-17.7	-17.6	-17.6	-10.8	-21.1	-17.6	-17.6	-0.6	-4.0	-14.3	-10.8	-4.0	-10.8				
STOP	-	-18.1	-18.1	-18.1	-17.7	-17.7	-17.7	-17.7	-21.1	-21.1	-14.3	-17.6	-17.6	-17.6	-14.2	-14.2	-21.0	-21.0	-10.8	-17.6				
Ref No.	IC7501																							
	MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80			
REC	-17.6	-17.6	-17.6	-17.9	-	-	-	-	-	-	4.9	-	-	-0.2	-0.4	-	-	0	0	0				
PLAY	-21.1	-21.1	-21.4	-4.4	-	-	-	-	-	-	4.9	-	-	-0.2	-0.4	-	-	0	0	0				
STOP	-17.6	-17.6	-17.6	-17.9	-	-	-	-	-	-	4.9	-	-	-0.2	-0.4	-	-	0	0	0				
Ref No.	IC7501																							
	MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100			
REC	-	0	0	0	-	-	-	0	0	-21.6	-	-	-	-	0	-	-	0	0	4.9				
PLAY	-	0	0	0	-	-	-	0	0	-21.6	-	-	-	-	0	-	-	0	0	4.9				
STOP	-	0	0	0	-	-	-	0	0	-21.6	-	-	-	-	0	-	-	0	0	4.9				
Ref No.	IC7502								IC7514															
	MODE	1	2	3	4	5		1	2	3	4	5												
REC	3.2	3.3	0	-	-		4.9	5.2	0	-	-													
PLAY	3.2	3.3	0	-	-		4.9	5.2	0	-	-													
STOP	3.2	3.3	0	-	-		4.9	5.2	0	-	-													
Ref No.	Q1501								Q4003								Q4004				Q7401			
	MODE	1	2	3	4	5	6	7	8		E	C	B		E	C	B		S	D	G			
REC	12.4	12.4	12.4	6.2	12.3	12.3	12.3	12.3		0	0	-0.1		0	0	-0.1		3.3	5.1	3.3				
PLAY	12.4	12.4	12.4	6.2	12.3	12.3	12.3	12.3		0	0	-0.1		0	0	-0.1		3.3	5.1	3.3				
STOP	12.4	12.4	12.4	6.2	12.3	12.3	12.3	12.3		0	0	-0.1		0	0	-0.1		3.3	5.1	3.3				
Ref No.	Q7402				Q7501				Q7502				Q7503				Q7504							
	MODE	S	D	G		E	C	B		E	C	B		E	C	B		E	C	B				
REC	3.3	5.1	3.3		5.1	5.2	4.5		0	9.1	-0.2		0	-0.2	-0.4		3.3	4.9	3.3					
PLAY	3.3	5.1	3.3		5.1	5.2	4.5		0	9.3	-0.1		0	-0.1	-0.4		3.3	4.9	3.3					
STOP	3.3	5.1	3.3		5.1	5.2	4.5		0	9.1	-0.2		0	-0.2	-0.4		3.3	4.9	3.3					
Ref No.	Q7510				Q7511				Q7513				Q7514				Q7801							
	MODE	E	C	B		E	C	B		S	D	G		E	C	B		E	C	B				
REC	3.3	5.1	3.3		3.3	4.9	3.3		3.3	3.3	4.9		3.3	5.1	3.3		2.6	0	2.0					
PLAY	3.3	5.1	3.3		3.3	4.9	3.3		3.3	3.3	4.9		3.3	5.1	3.3		2.6	0	2.0					
STOP	3.3	5.1	3.3		3.3	4.9	3.3		3.3	3.3	4.9		3.3	5.1	3.3		2.6	0	2.0					
Ref No.	QR1501				QR1502				QR4001				QR4002				QR4003							
	MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B				
REC	0	0	4.9		0	5.9	0		0	0	2.3		5.1	-0.1	5.1		0	5.1	0					
PLAY	0	0	4.9		0	5.9	0		0	0	2.3		5.1	-0.1	5.1		0	5.1	0					
STOP	0	0	4.9		0	5.9	0		0	0	2.3		5.1	-0.1	5.1		0	5.1	0					
Ref No.	QR7501				QR7502				QR7503															
	MODE	E	C	B		E	C	B		E	C	B												
REC	5.0	4.9	0		0	0	3.2		5.1	0	5.0													
PLAY	5.0	4.9	0		0	0	3.2		5.1	0	5.0													
STOP	5.0	4.9	0		0	0	3.2		5.1	0	5.0													

Ref No. MODE	IC1502								IC1504											
	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7				
REC	5.2	-	3.4	0	6.1	-	-	6.1		5.0	-	0	3.2	4.9	0	6.1				
PLAY	5.2	-	3.4	0	6.1	-	-	6.1		5.0	-	0	3.2	4.9	0	6.1				
STOP	5.2	-	3.4	0	6.1	-	-	6.1		5.0	-	0	3.2	4.9	0	6.1				
Ref No. MODE	IC1505					IC1506														
	1	2	3	4	5		1	2	3	4	5									
REC	6.1	0	4.9	-	5.0		4.9	6.1	0	5.1	5.1									
PLAY	6.1	0	4.9	-	5.0		4.9	6.1	0	5.1	5.1									
STOP	6.1	0	4.9	-	5.0		4.9	6.1	0	5.1	5.1									
Ref No. MODE	IC1507																			
	1	2	3	4	5	6	7	8												
REC	3.3	-	3.2	0	4.9	-	-	4.0												
PLAY	3.3	-	3.2	0	4.9	-	-	4.0												
STOP	3.3	-	3.2	0	4.9	-	-	4.0												
Ref No. MODE	IC3001																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	1.4	0	2.0	5.0	1.4	4.9	1.4	4.7	0.1	2.7	0	1.4	4.9	1.4	0	0.1	2.7	0	1.8	4.9
PLAY	1.4	0	2.0	5.0	1.4	4.9	1.4	4.7	0.1	2.7	0	1.4	4.9	1.4	0	0.1	2.7	0	1.8	4.9
STOP	1.4	0	2.0	5.0	1.4	4.9	1.4	4.7	0.1	2.7	0	1.4	4.9	1.4	0	0.1	2.7	0	1.8	4.9
Ref No. MODE	IC3001																			
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	1.4	0	0.1	2.7	4.9	1.7	1.8	1.9	1.9	2.2	0	2.2	2.2	2.2	2.2	1.7	1.7	0	1.8	5.0
PLAY	1.4	0	0.1	2.7	4.9	1.7	1.8	1.9	1.9	2.2	0	2.2	2.2	2.2	2.2	1.7	1.7	0	1.8	5.0
STOP	1.4	0	0.1	2.7	4.9	1.8	1.8	1.9	1.9	2.2	0	2.2	2.2	2.2	2.2	1.7	1.7	0	1.8	5.0
Ref No. MODE	IC3001																			
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	2.8	0	2.8	4.9	2.8	2.8	1.8	-	2.8	0	2.8	4.9	2.8	2.9	1.1	0	5.1	5.1	5.1	0.1
PLAY	2.8	0	2.8	4.9	2.8	2.8	1.8	-	2.8	0	2.8	4.9	2.8	2.9	1.1	0	5.1	5.1	5.1	0.1
STOP	2.8	0	2.8	4.9	2.8	2.8	1.8	-	2.8	0	2.8	4.9	2.8	2.9	1.1	0	5.1	5.1	5.1	0.1
Ref No. MODE	IC3001																			
	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	-	0.8	0.8	5.0	1.3	-	-	-	2.0	0	-	5.0	-	0	-	0	0	5.0	-	0
PLAY	-	0.8	0.8	5.0	1.3	-	-	-	2.0	0	-	5.0	-	0	-	0	0	5.0	-	0
STOP	-	0.8	0.8	5.0	1.3	-	-	-	2.0	0	-	5.0	-	0	-	0	0	5.0	-	0

12 Schematic Diagram

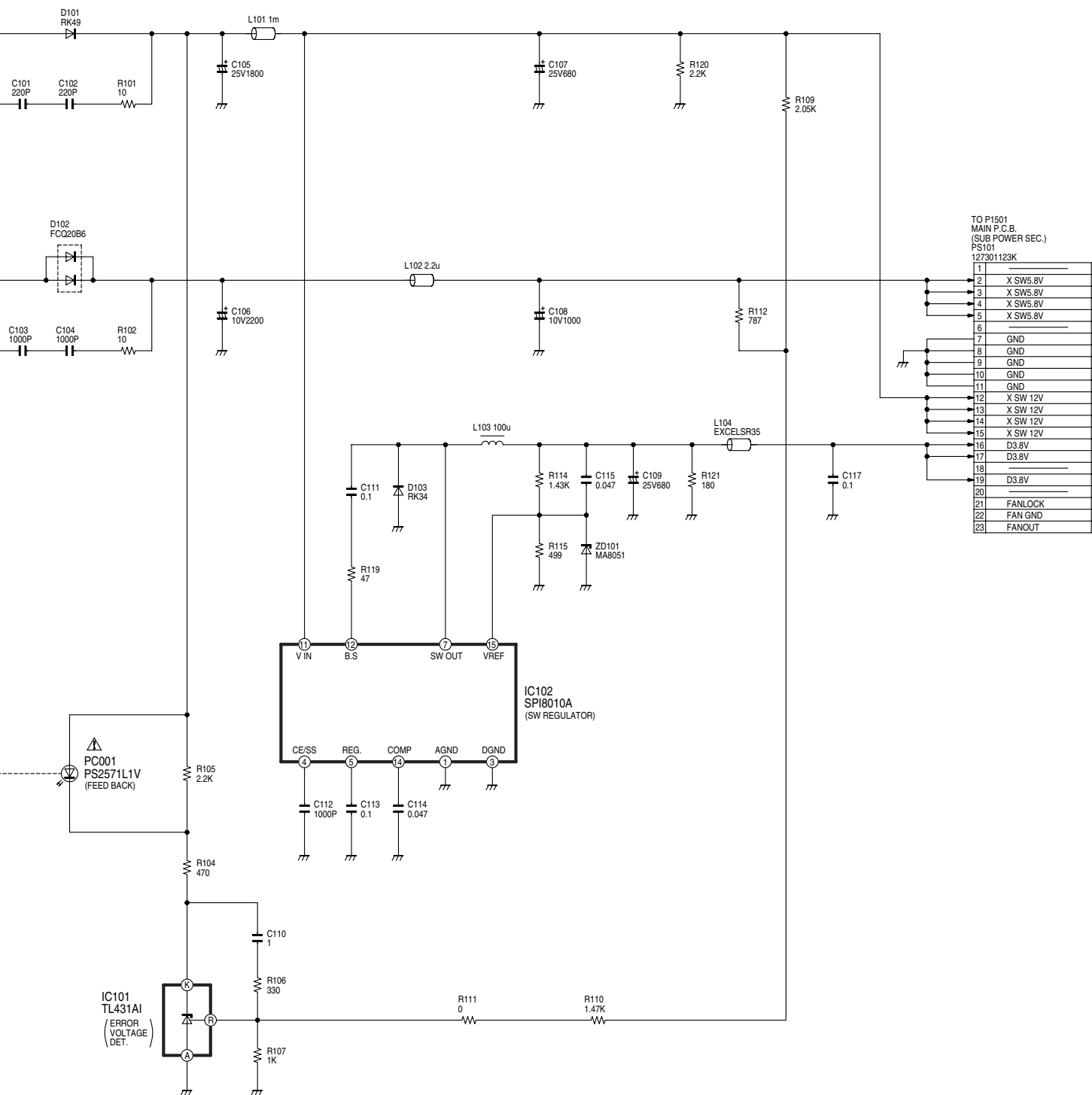
12.1. Interconnection Schematic Diagram





DMR-ES15PL
Interconnection
Schematic Diagram

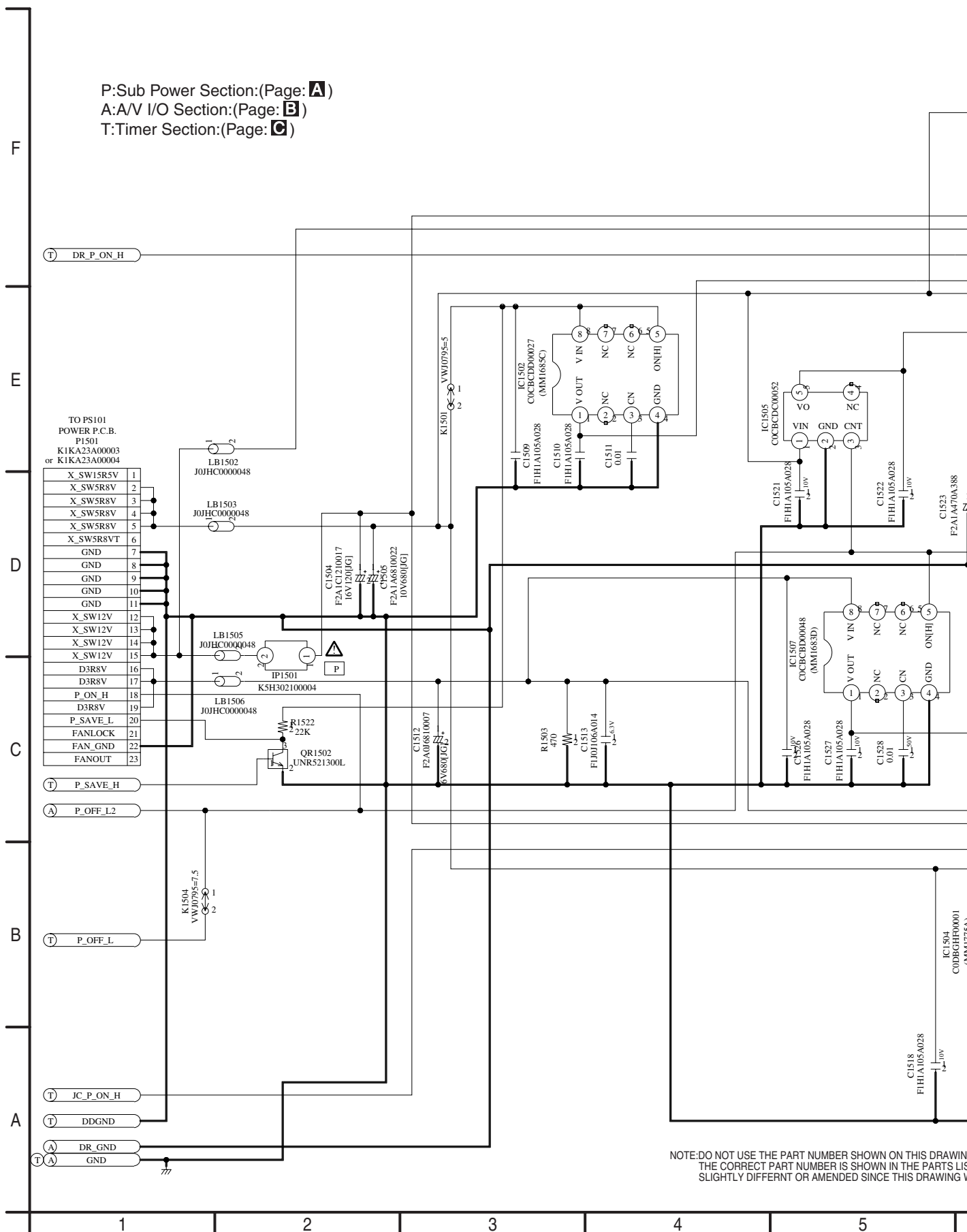




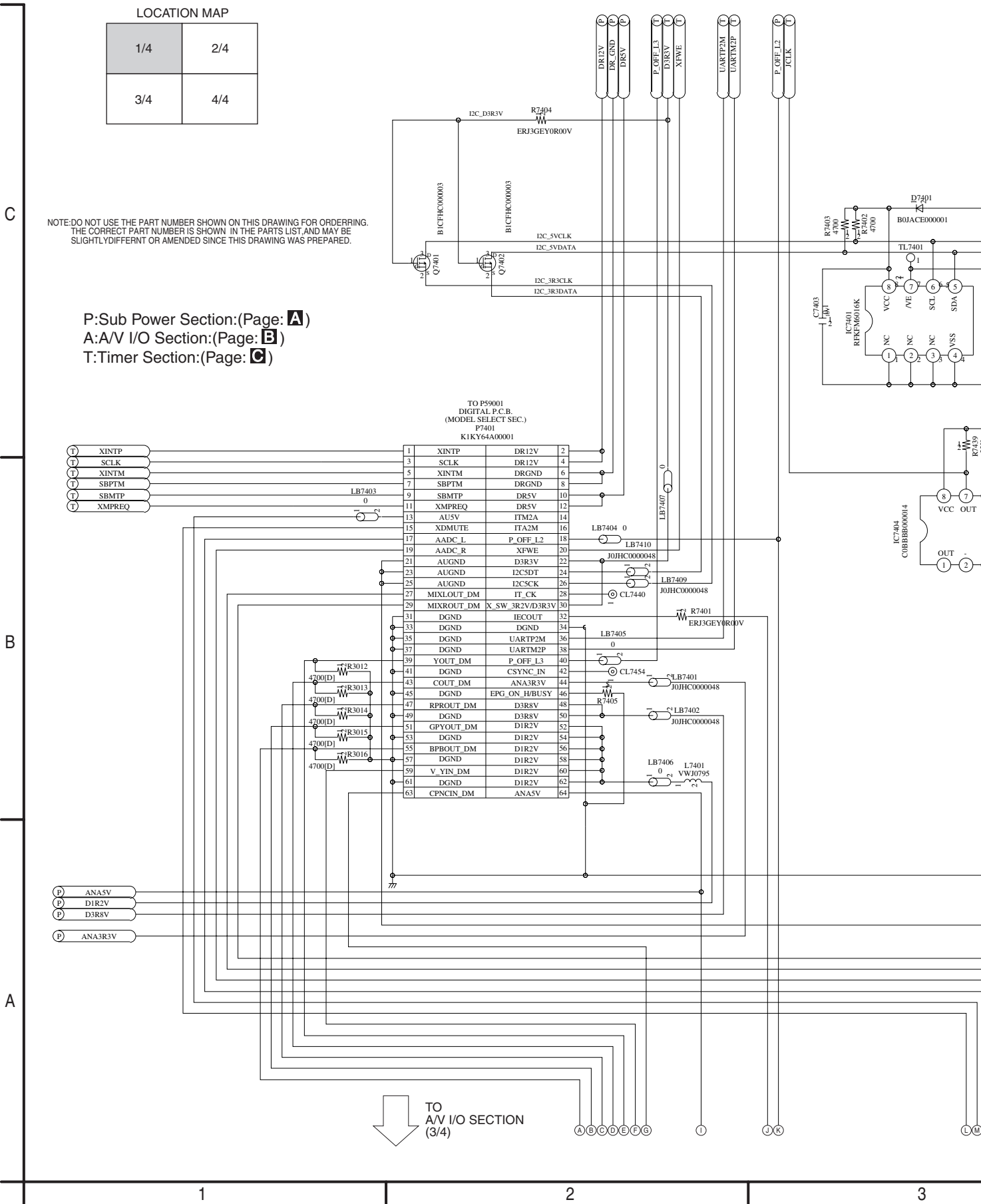
THIS DRAWING FOR ORDERING.THE CORRECT PART NUMBER IS SHOWN
FERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES15PL
Main Power Supply
Schematic Diagram

12.3. Sub Power Section (Main P.C.B. (1/31)) Schematic Diagram (P)



12.4. A/V I/O (1/4) Section (Main P.C.B. (2/3)) Schematic Diagram (A)





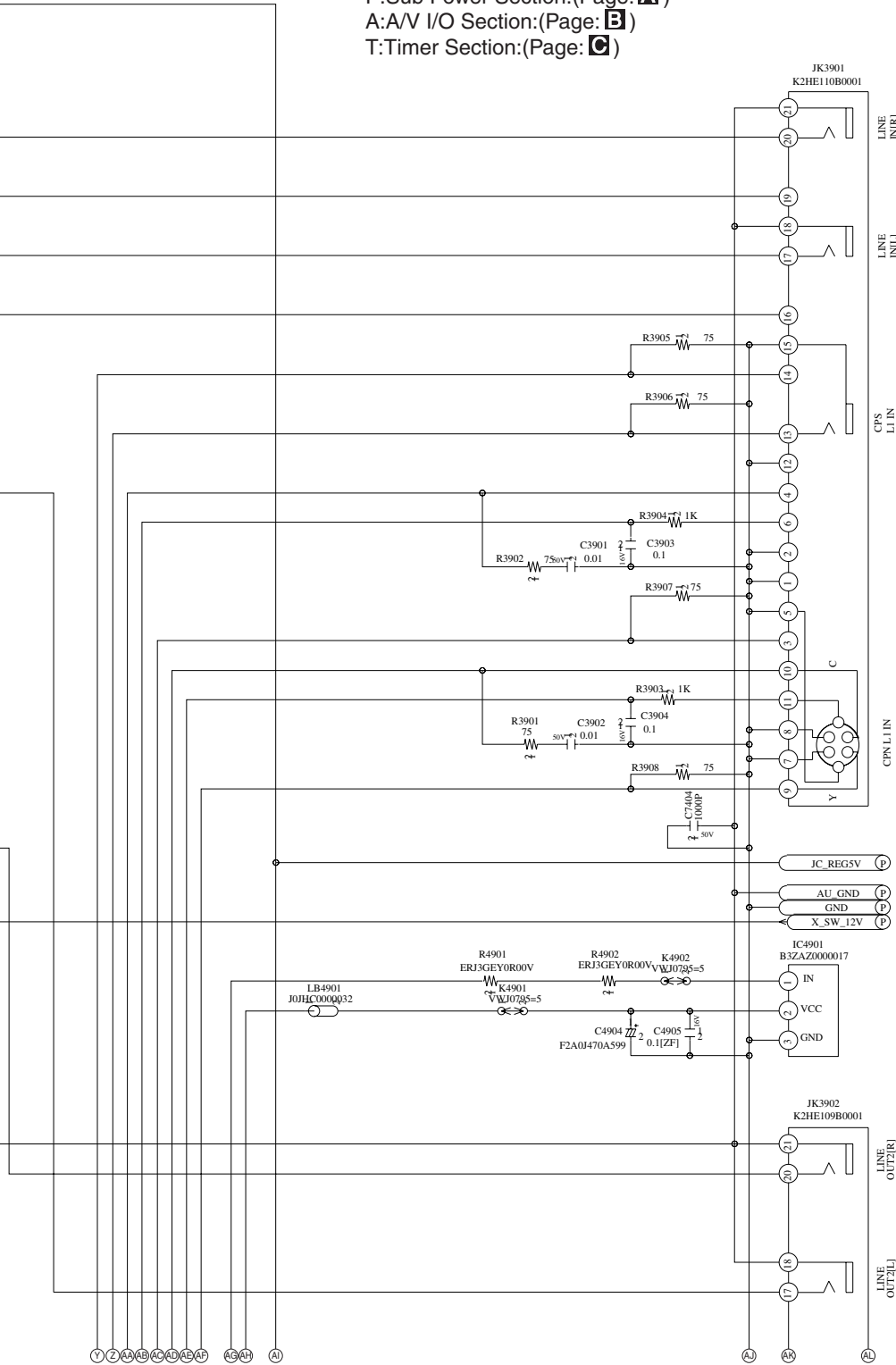
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

LOCATION MAP

1/4	2/4
3/4	4/4

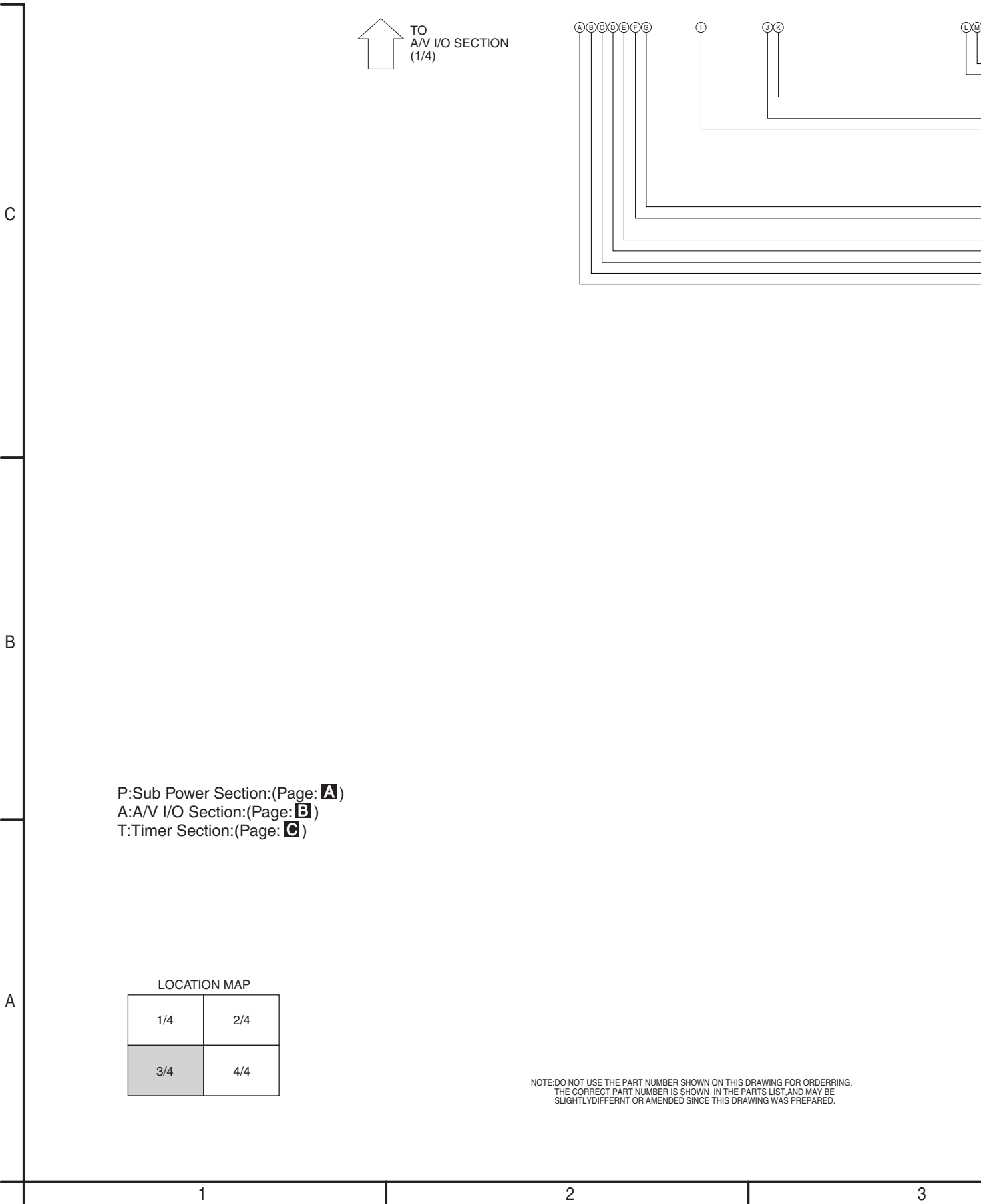
B

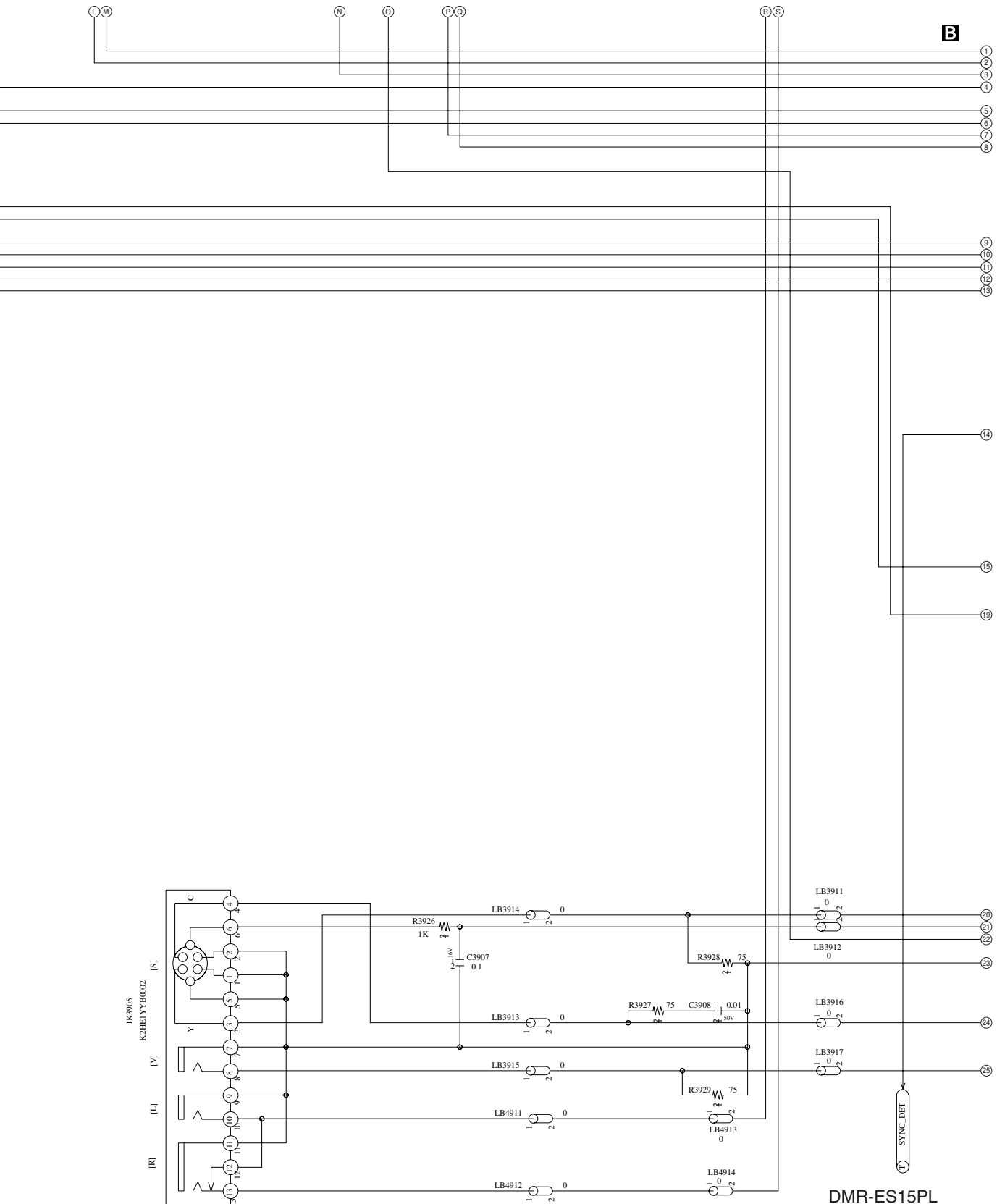
P:Sub Power Section:(Page: **A**)
A:A/V I/O Section:(Page: **B**)
T:Timer Section:(Page: **C**)



DMR-ES15PL
A/V I/O(2/4) Section
(Main P.C.B.(2/3))
Schematic Diagram(A)

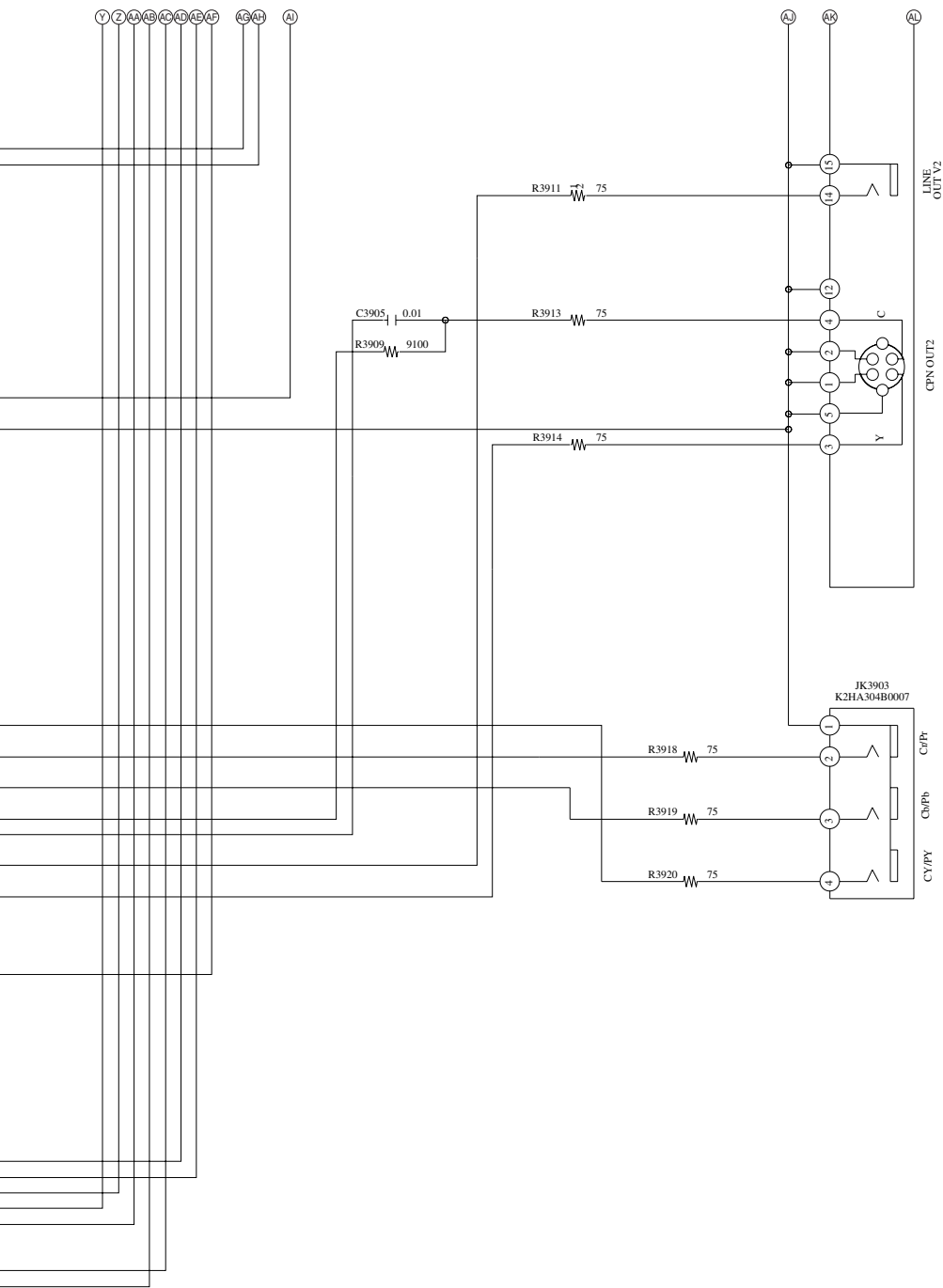
12.6. A/V I/O (3/4) Section (Main P.C.B. (2/3)) Schematic Diagram (A)





DMR-ES15PL
A/V I/O(3/4) Section
(Main P.C.B.(2/3))
Schematic Diagram(A)





B

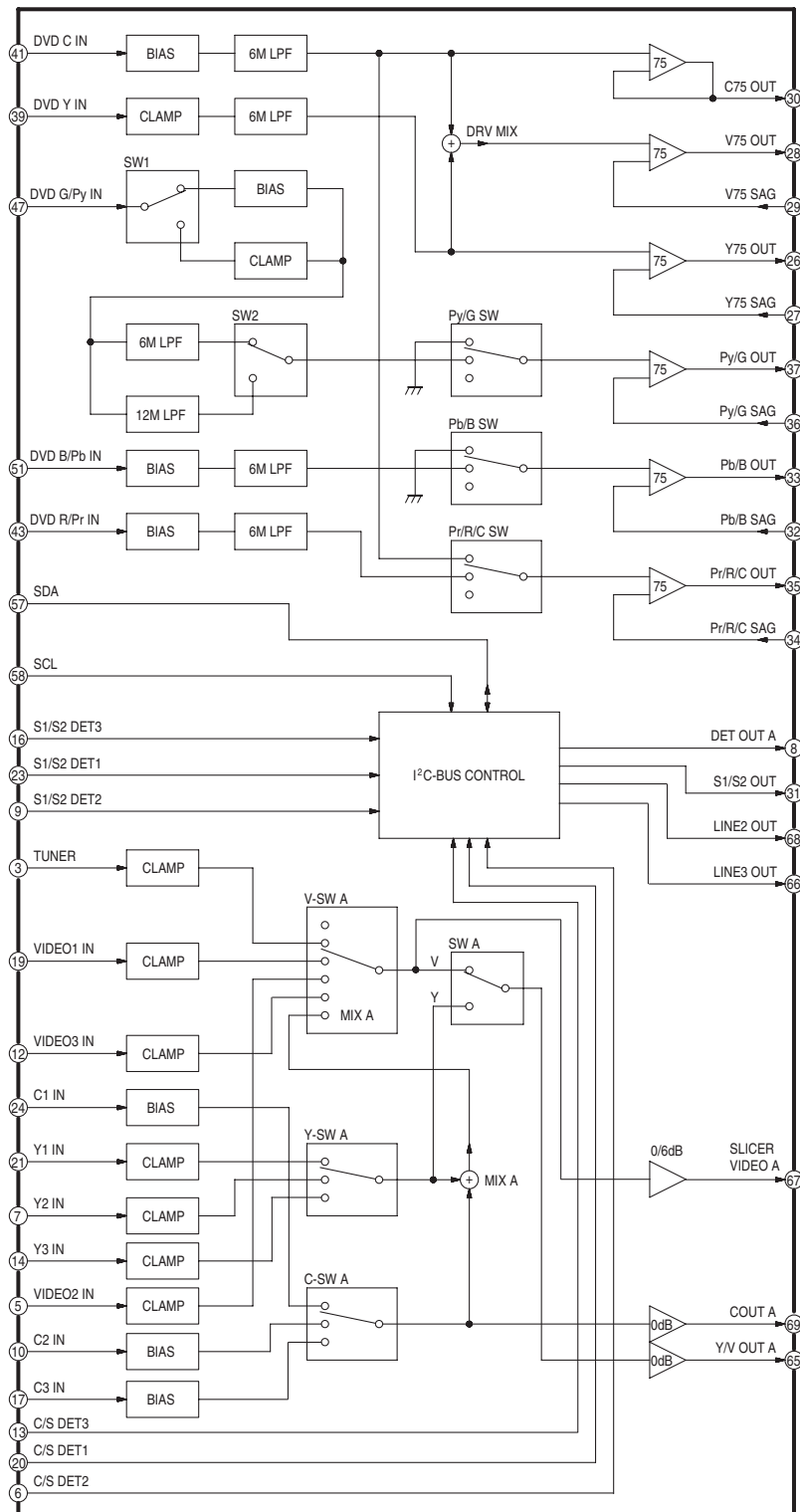
LOCATION MAP

1/4	2/4
3/4	4/4

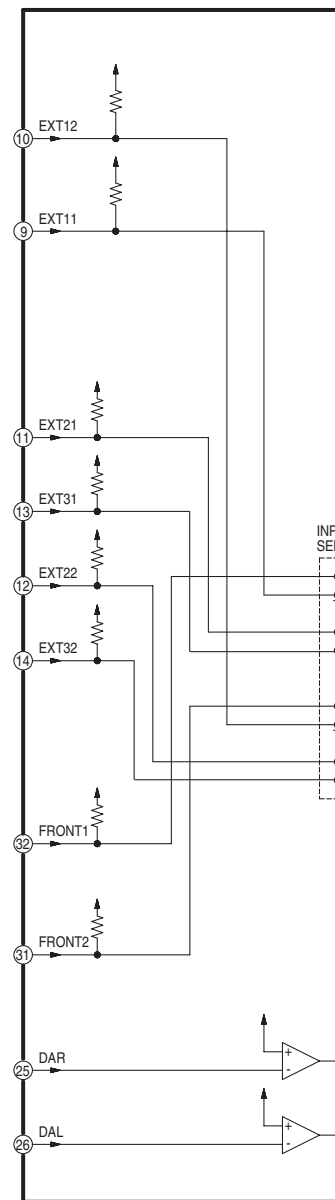
P:Sub Power Section:(Page: **A**)
A:A/V I/O Section:(Page: **B**)
T:Timer Section:(Page: **C**)

DMR-ES15PL
A/V I/O(4/4) Section
(Main P.C.B.(2/3))
Schematic Diagram(A)

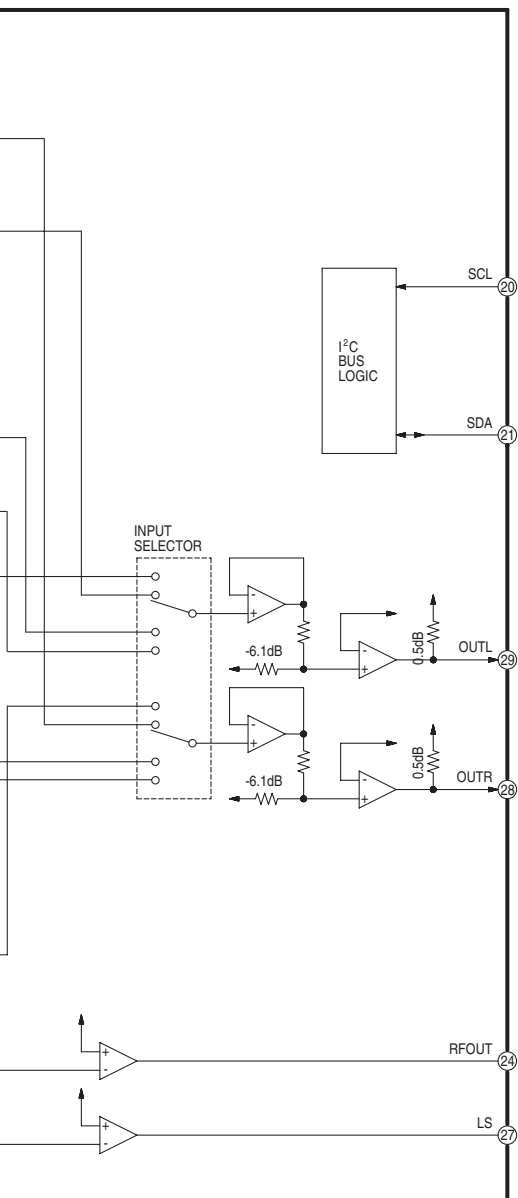
IC3001 **VIDEO PROCESSOR** **IC-DETAIL BLOCK DIAGRAM**



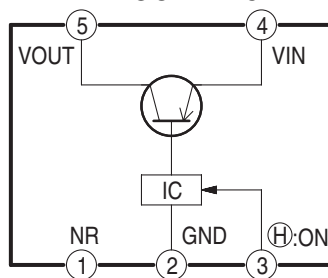
IC4001 **AUDIO PROCESSOR** **IC-DETAIL BLOCK DIAGRAM**



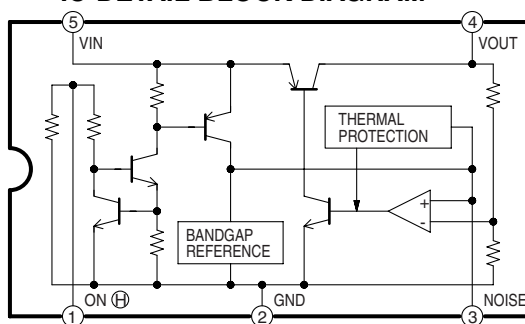
IC4001 **AUDIO PROCESSOR** **IC-DETAIL BLOCK DIAGRAM**



IC4002 **AU +5V SWITCHING REGULATOR** **IC-DETAIL BLOCK DIAGRAM**



IC4003 **AU +9V SWITCHING REGULATOR** **IC-DETAIL BLOCK DIAGRAM**



IC3001 Detail Block Diagram
 IC4001 Detail Block Diagram
 IC4002 Detail Block Diagram
 IC4003 Detail Block Diagram
 DMR-ES15PL IC-Detail Block Diagram

12.8. Timer (1/4) Section (Main P.C.B. (3/3)) Schematic Diagram (FL)

LOCATION MAP

1/4	2/4
3/4	4/4

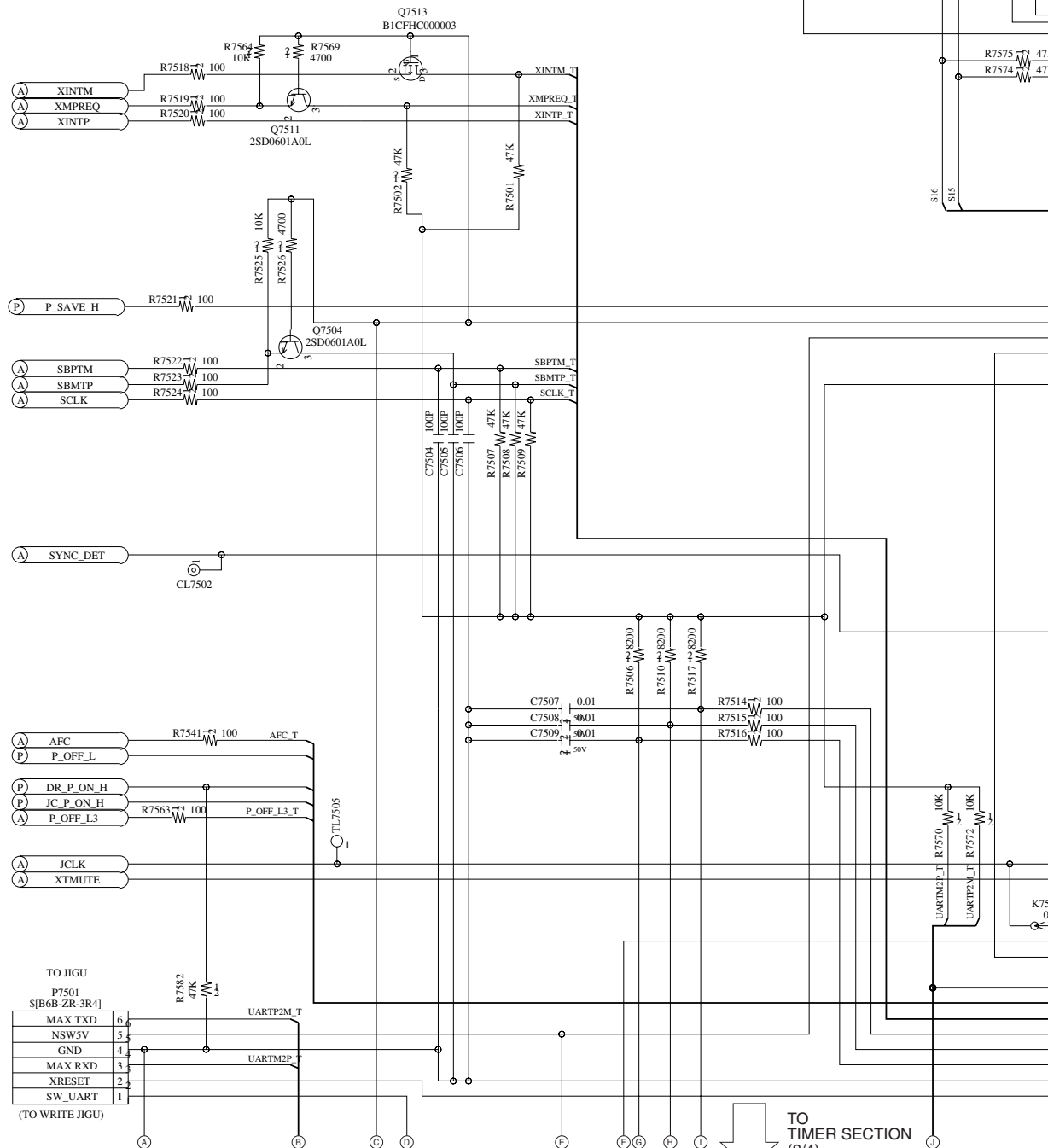
P:Sub Power Section:(Page: **A**)
A:A/V I/O Section:(Page: **B**)
T:Timer Section:(Page: **C**)

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

C

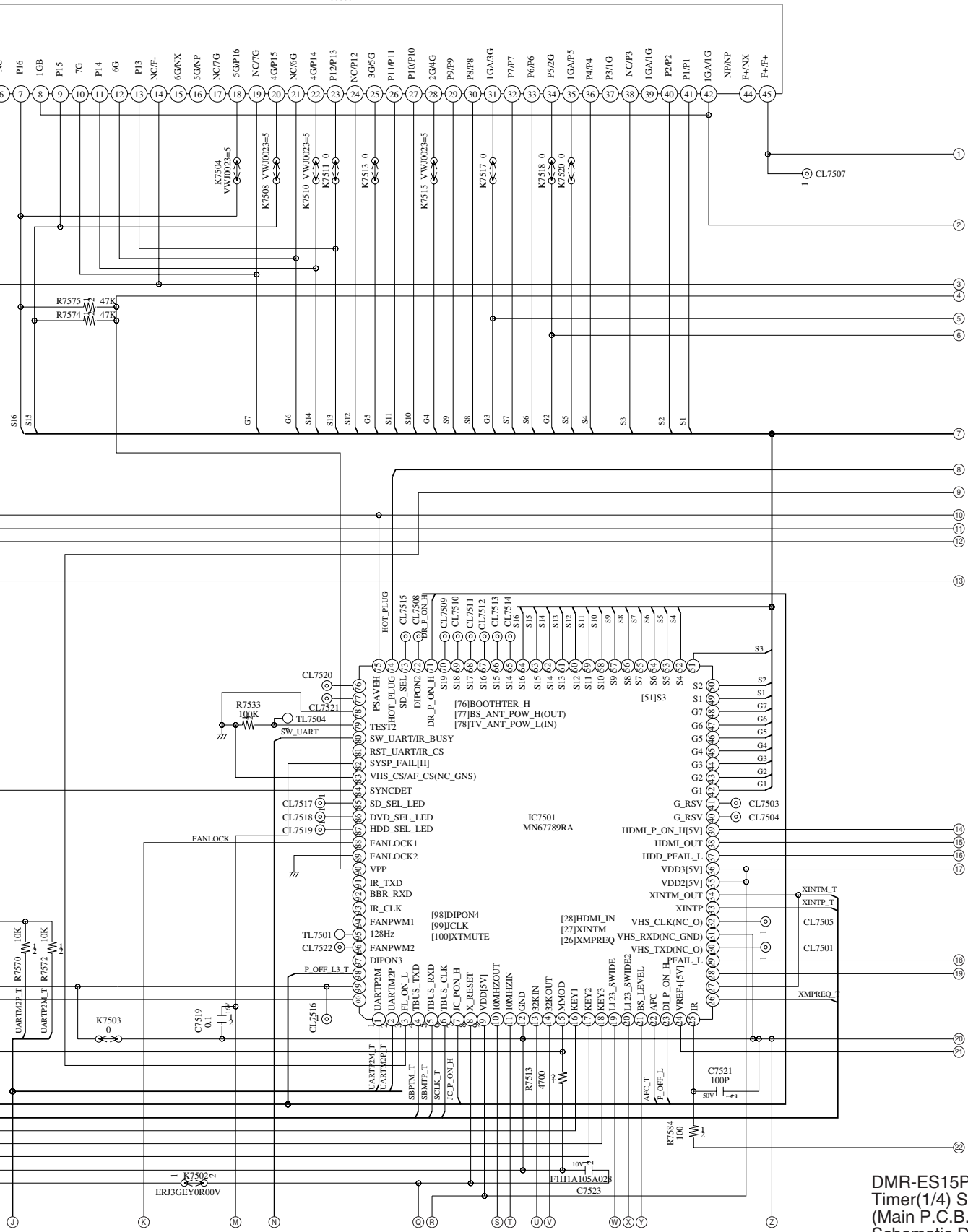
B

A

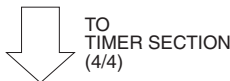


DP7501
A2BD00000144

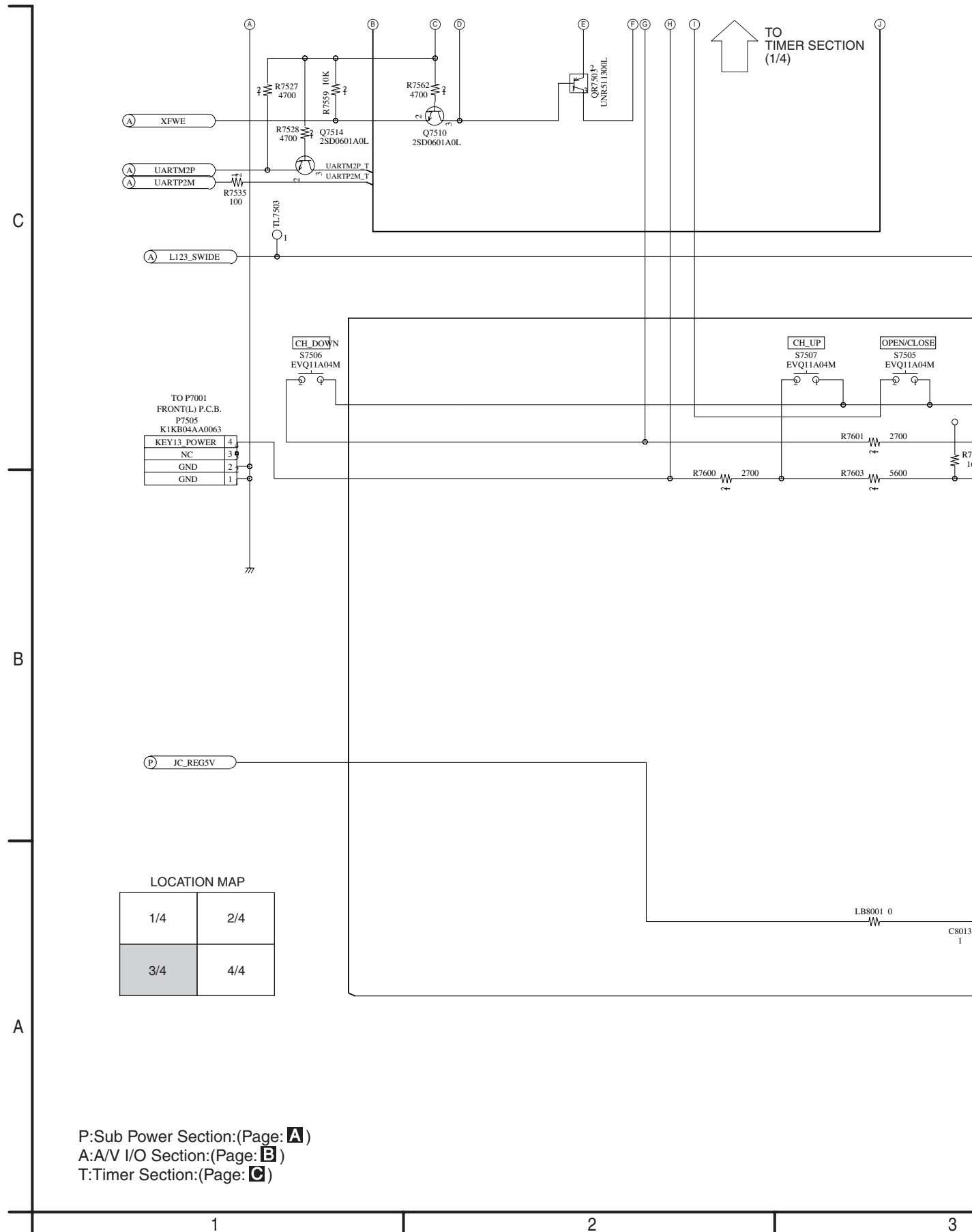
C



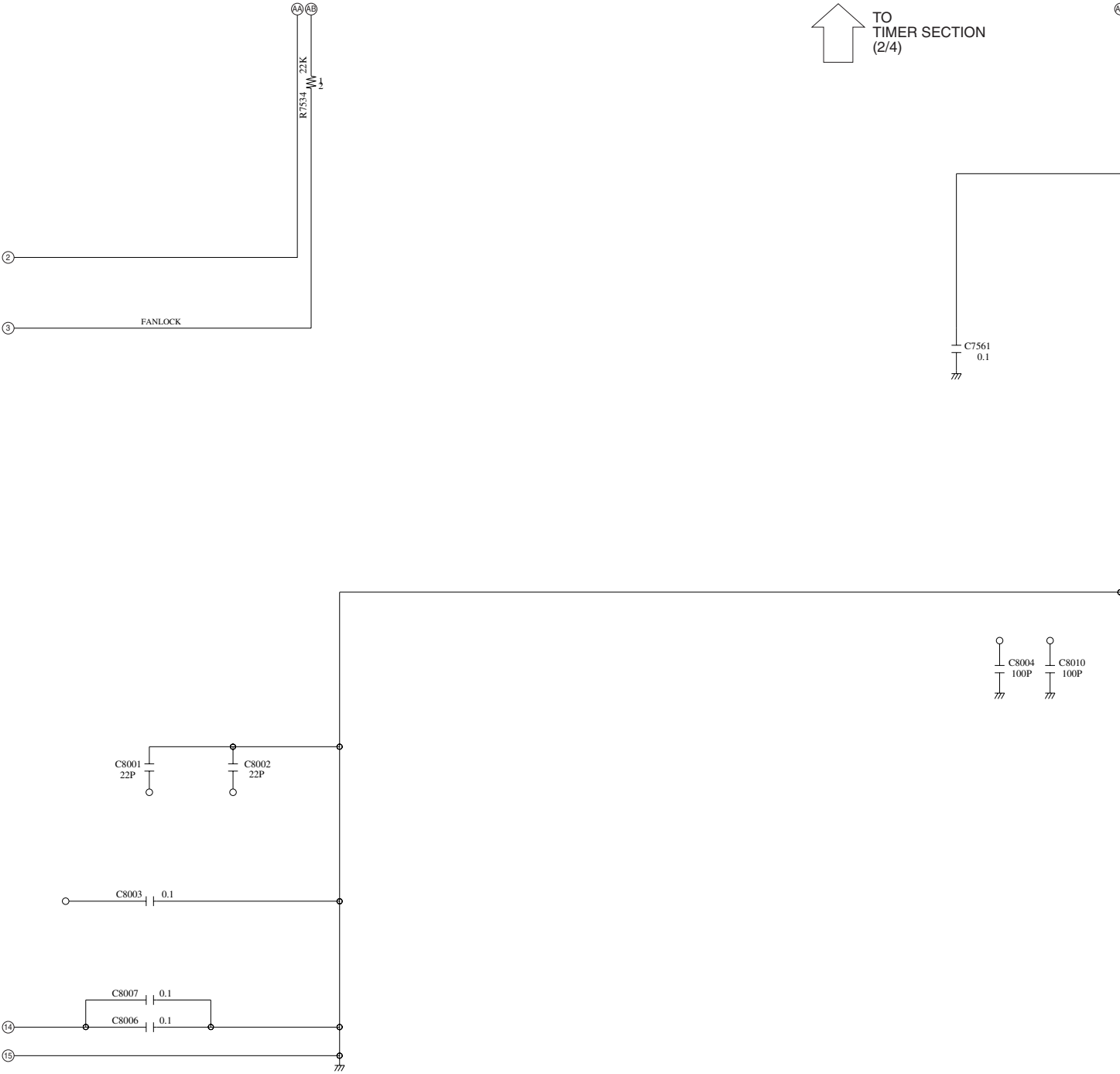
DMR-ES15PL
Timer(1/4) Section
(Main P.C.B.(3/3))
Schematic Diagram(T)



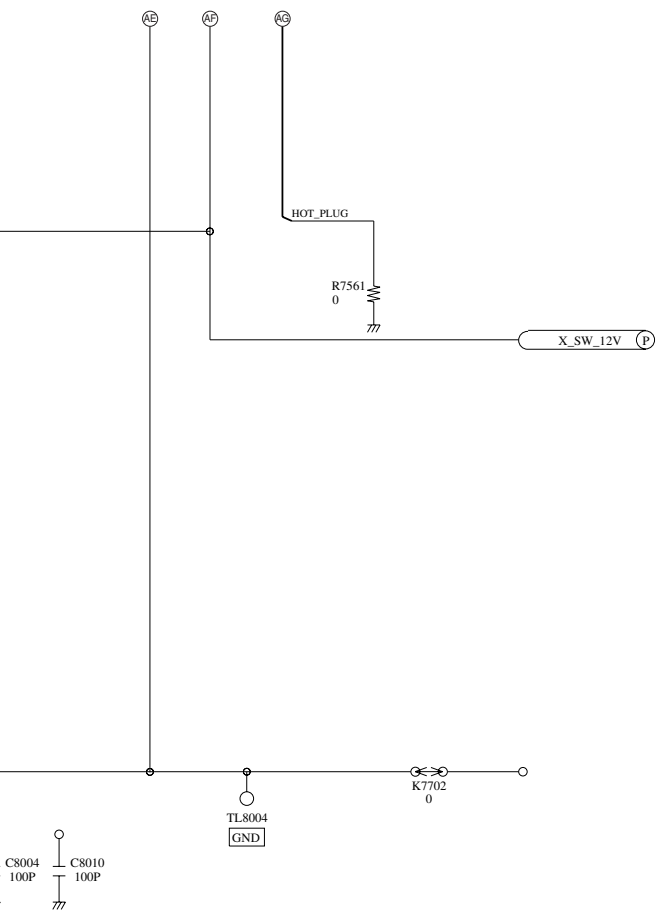
12.10. Timer (3/4) Section (Main P.C.B. (3/3)) Schematic Diagram (FL)



12.11. Timer (4/4) Section (Main P.C.B. (3/3)) Schematic Diagram (FL)



NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST AND MAY BE
SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.



C

LOCATION MAP

1/4	2/4
3/4	4/4

P:Sub Power Section:(Page: **A**)
A:A/V I/O Section:(Page: **B**)
T:Timer Section:(Page: **C**)

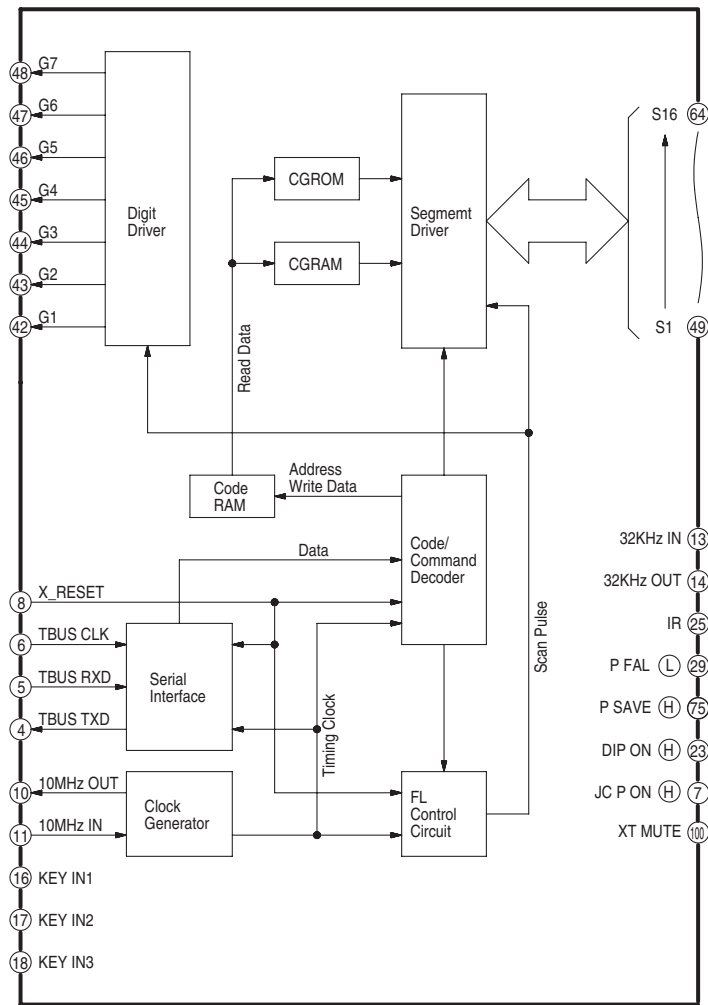
DMR-ES15PL
Timer(4/4) Section
(Main P.C.B.(3/3))
Schematic Diagram(T)

8

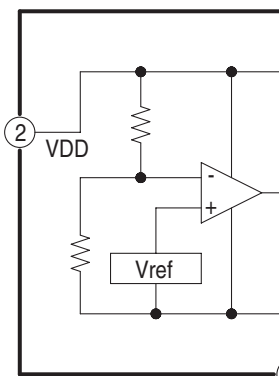
9

10

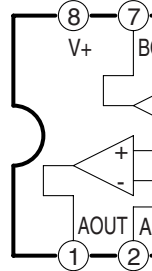
**IC7501
TIMER
IC-DETAIL BLOCK DIAGRAM**



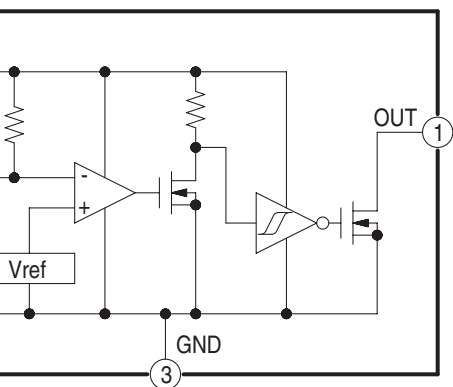
**IC7502
3.3V Dector
IC-DETAIL BL**



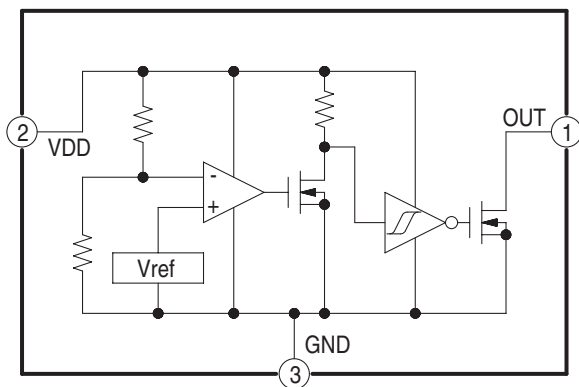
**IC7504
FAN MTER D
IC-DETAIL BL**



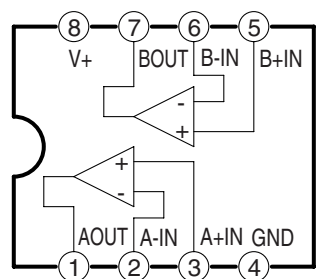
IC7502
3V Detector
IC-DETAIL BLOCK DIAGRAM



IC7514
5V Detector
IC-DETAIL BLOCK DIAGRAM

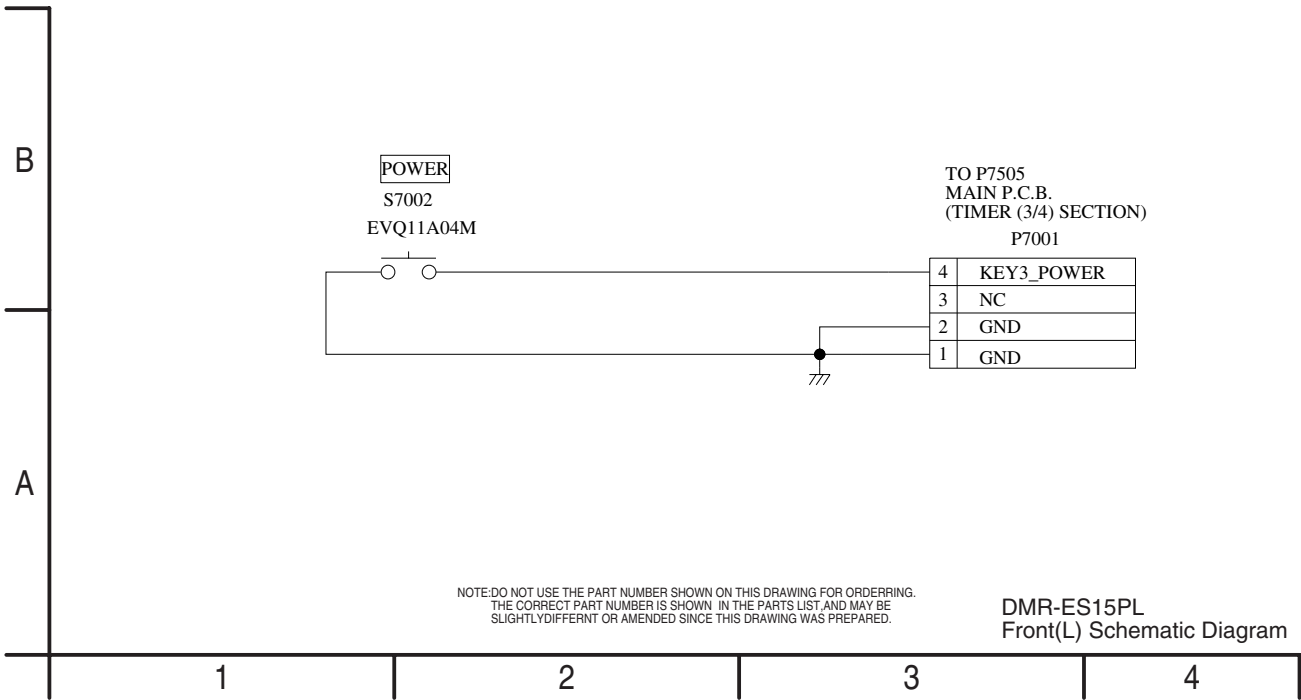


IC7504
ANALOG MOTOR DRIVE
IC-DETAIL BLOCK DIAGRAM

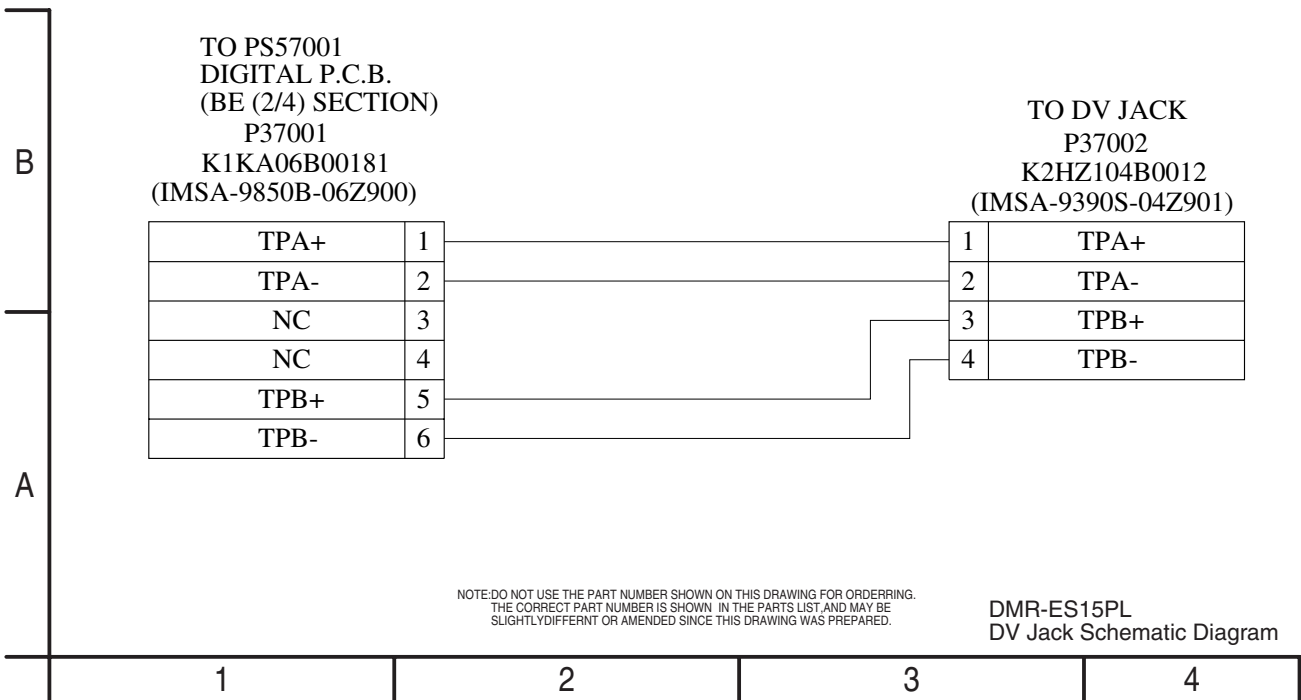


IC7501 Detail Block Diagram
 IC7502 Detail Block Diagram
 IC7504 Detail Block Diagram
 IC7514 Detail Block Diagram
 DMR-ES15PL IC-Detail Block Diagram

12.12. Front (L) Schematic Diagram

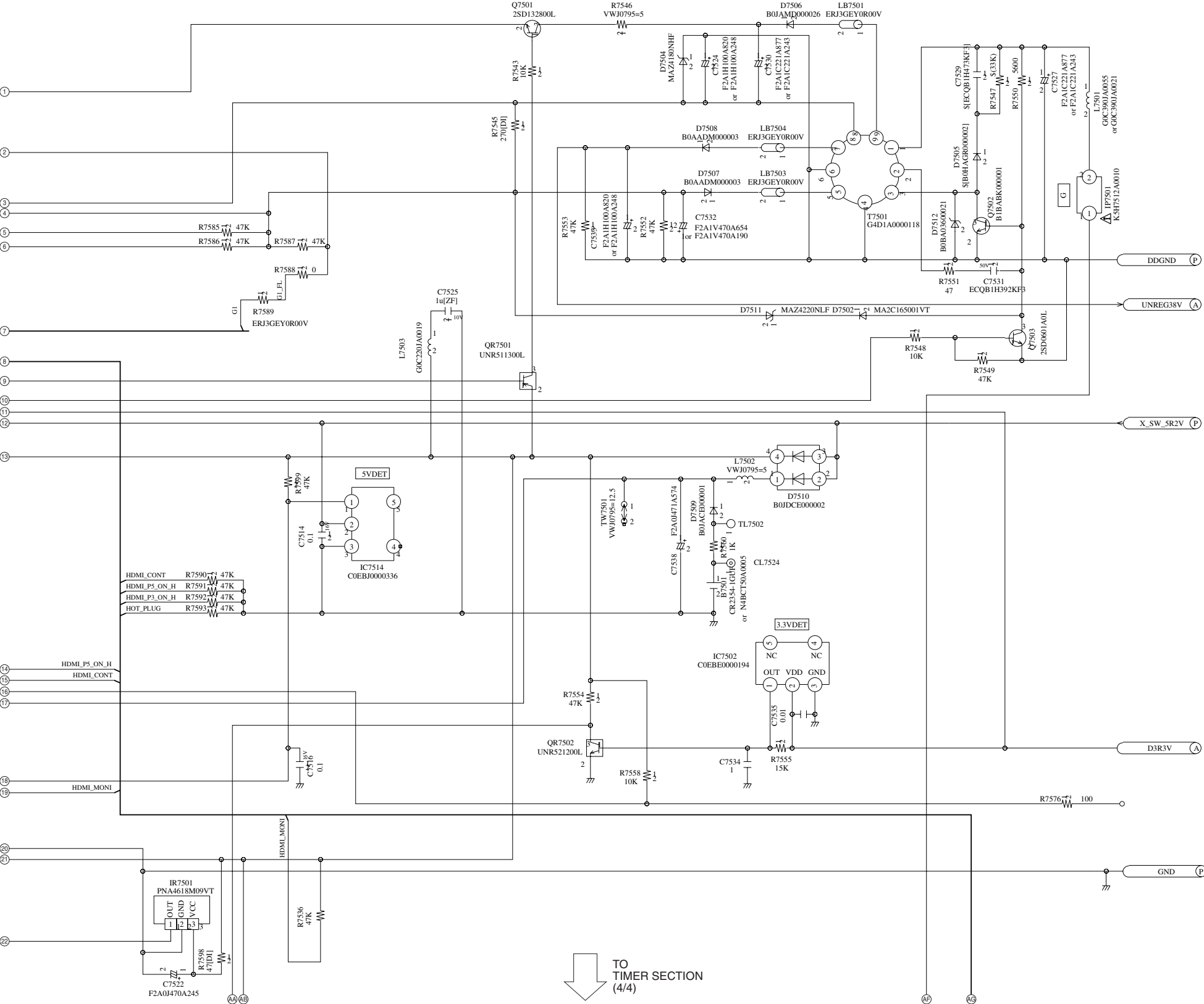


12.13. DV Jack Schematic Diagram





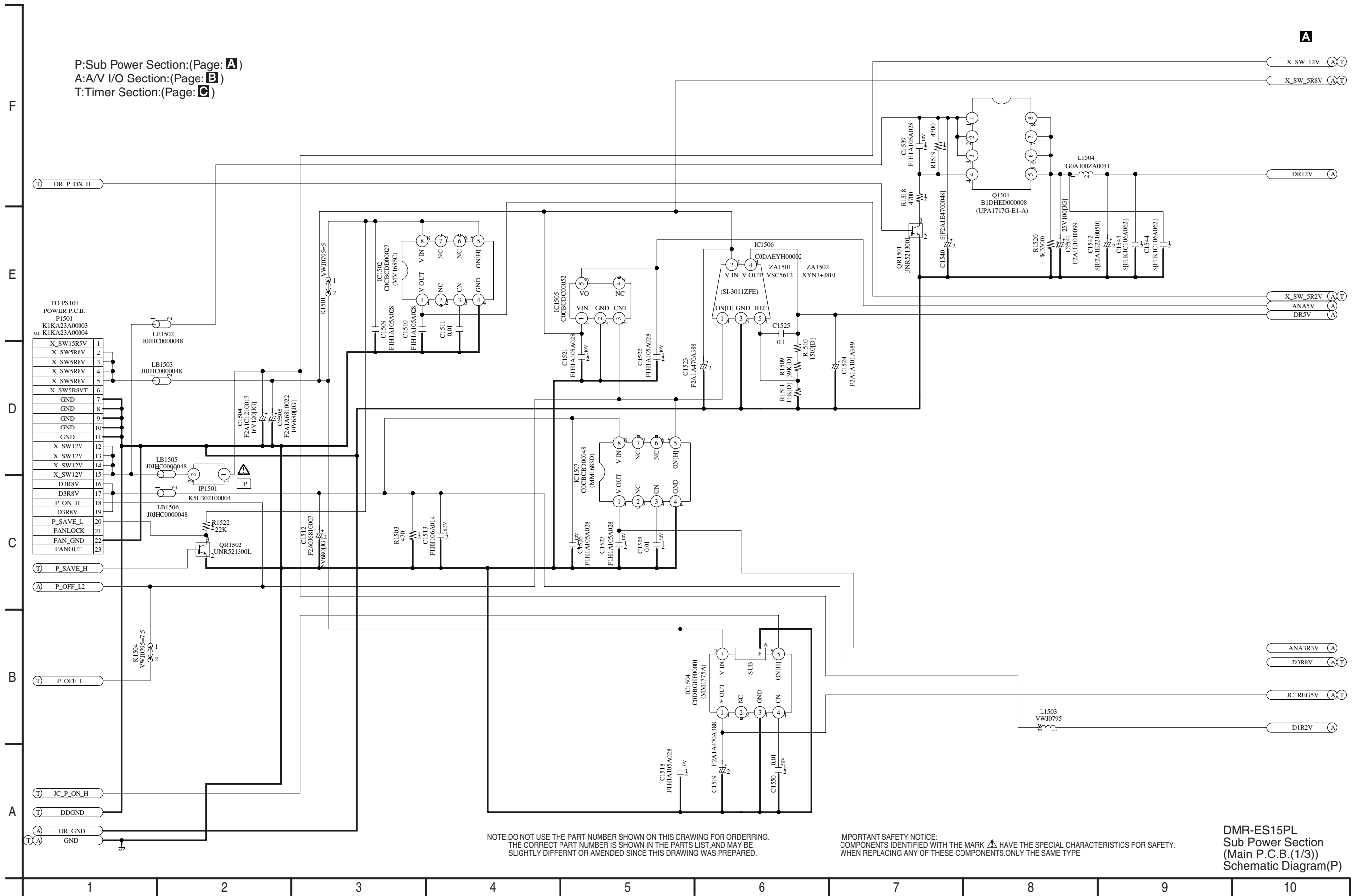
1/4	2/4
3/4	4/4



P:Sub Power Section:(Page: A)
A:A/V I/O Section:(Page: B)
T:Timer Section:(Page: C)

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,ONLY THE SAME TYPE.



P:Sub Power Section:(Page: **A**)
A:A/V I/O Section:(Page: **B**)
T:Timer Section:(Page: **C**)

TO PS101
POWER P.C.B.
P1501
K1KA23A00003
or K1KA23A00004

X_SW15R5V	1
X_SW5R8V	2
X_SW5R8V	3
X_SW5R8V	4
X_SW5R8V	5
X_SW5R8VT	6
GND	7
GND	8
GND	9
GND	10
GND	11
X_SW12V	12
X_SW12V	13
X_SW12V	14
X_SW12V	15
D3R8V	16
D3R8V	17
P_ON_H	18
D3R8V	19
P_SAVE_L	20
FANLOCK	21
FAN_GND	22
FANOUT	23

T P_SAVE_H
A P_OFF_L2

T P_OFF_L

T JC_P_ON_H
T DDGND
T DR_GND
T GND

A

X_SW_12V (A) T

X_SW_5R8V (A) T

DR12V (A)

X_SW_5R2V (A) T

ANA5V (A)

DR5V (A)

ANA3R3V (A)

D3R8V (A) T

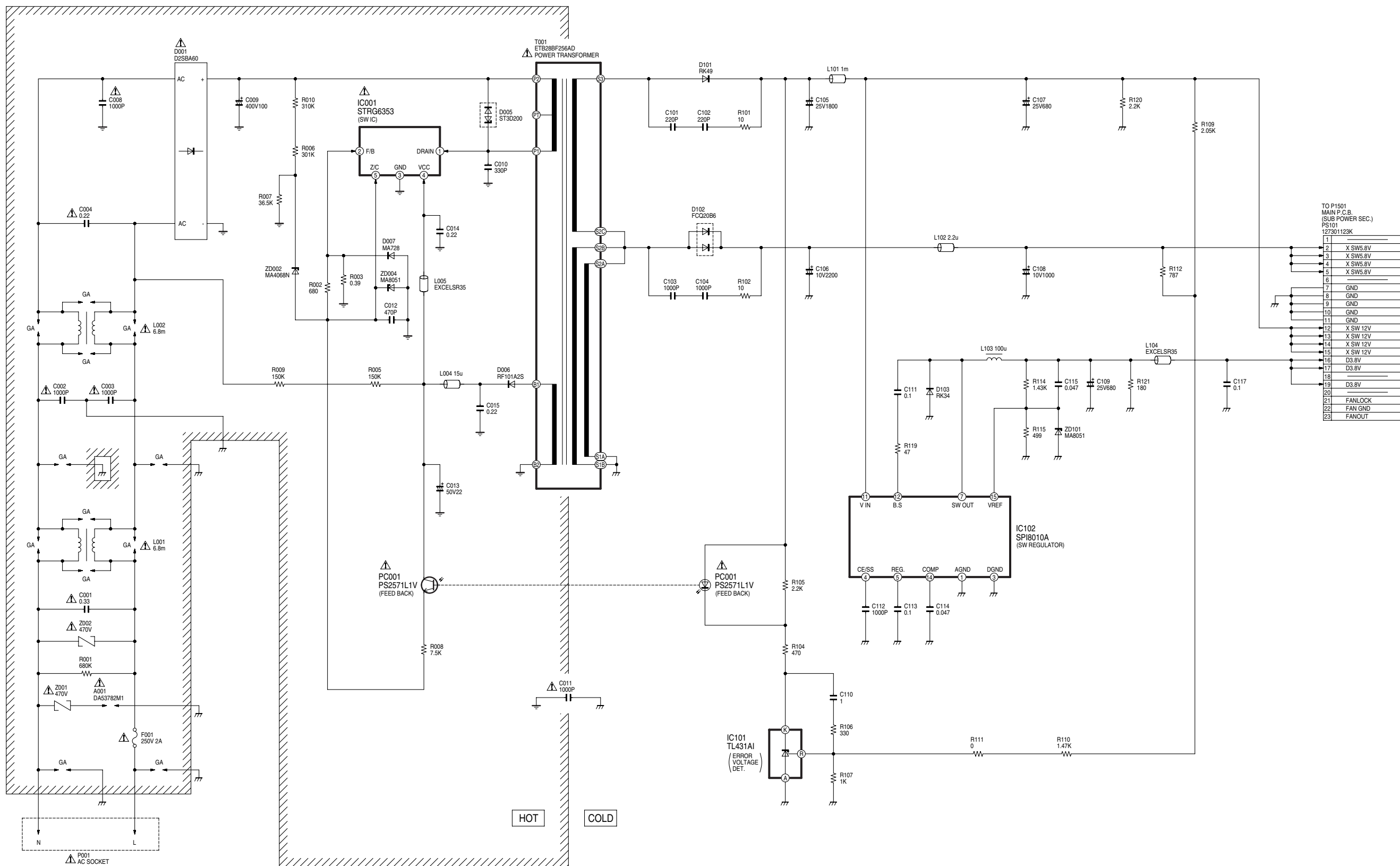
JC_REG5V (A) T

D1R2V (A)

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,ONLY THE SAME TYPE.

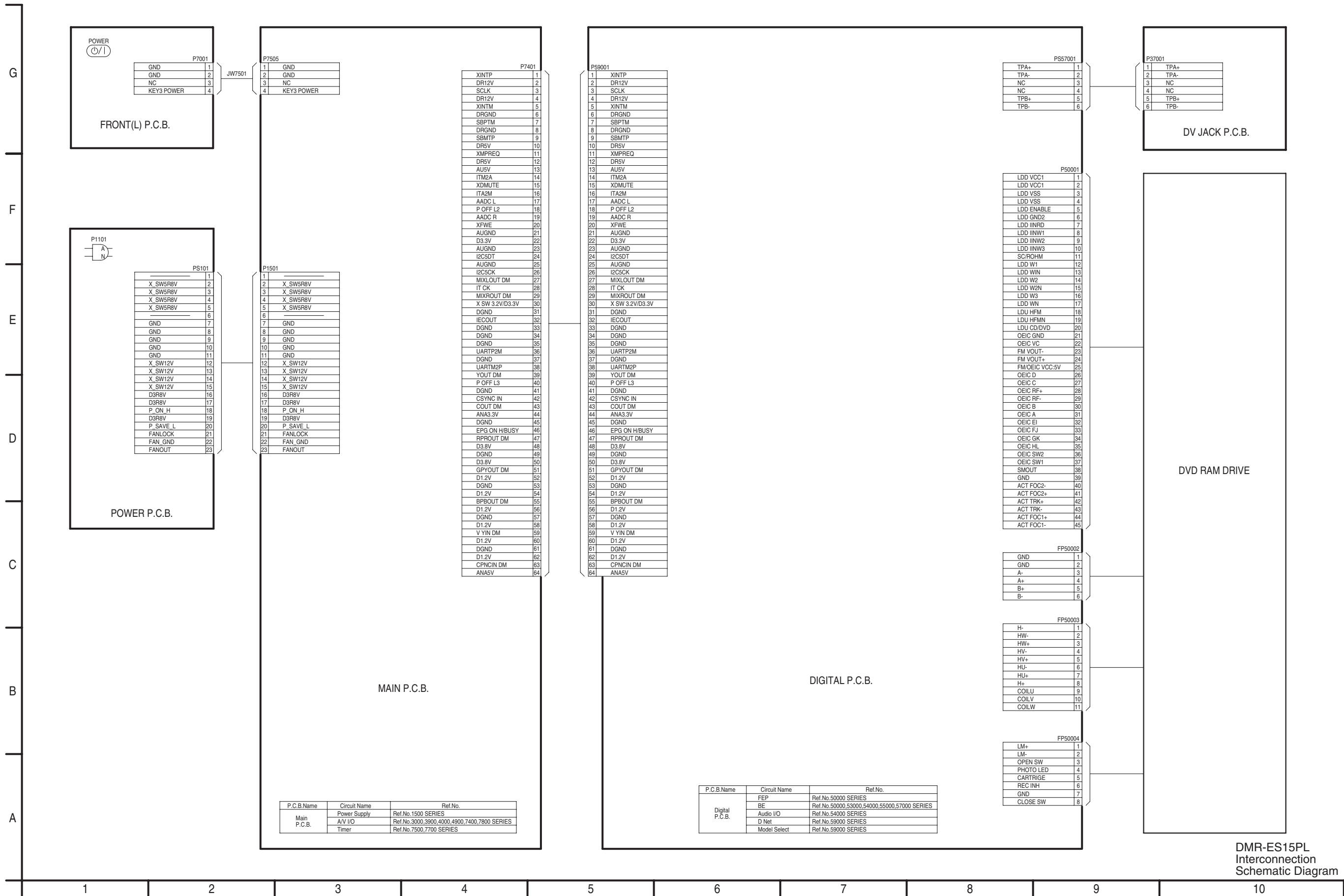
DMR-ES15PL
Sub Power Section
(Main P.C.B.(1/3))
Schematic Diagram(P)



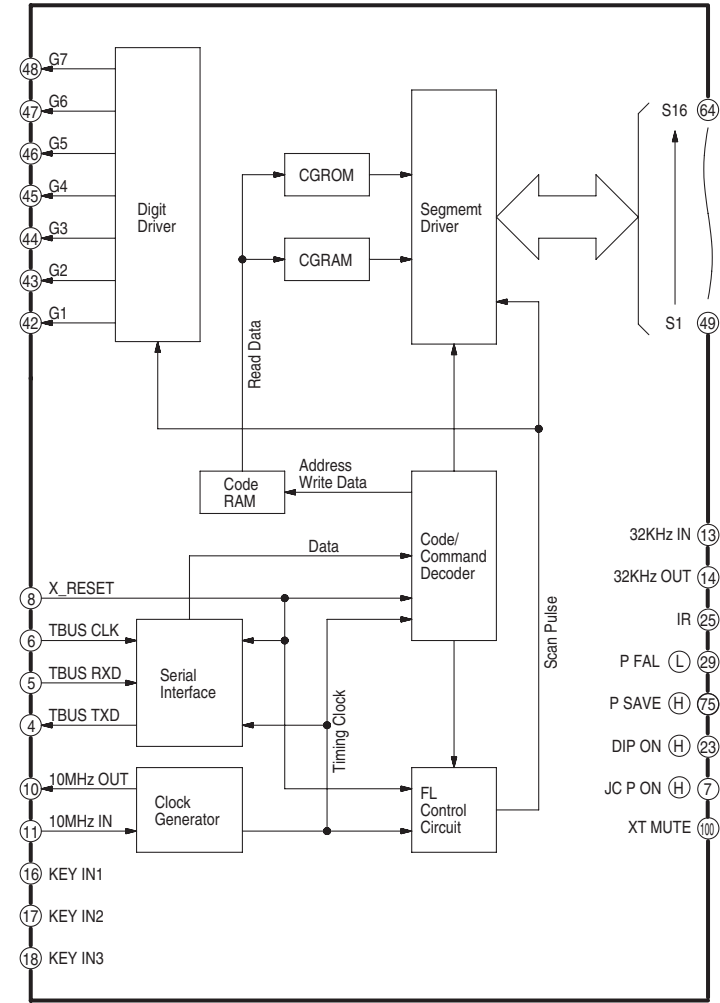
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, ONLY THE SAME TYPE.

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

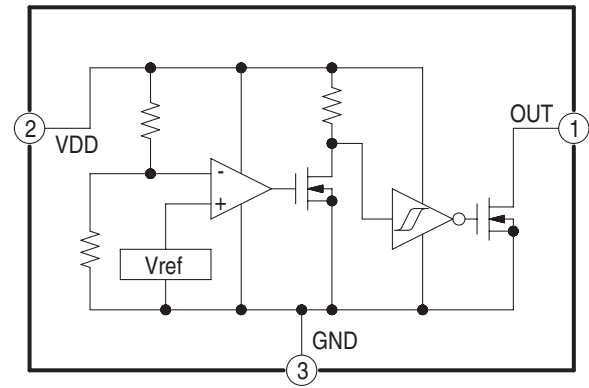
DMR-ES15PL Main Power Supply Schematic Diagram



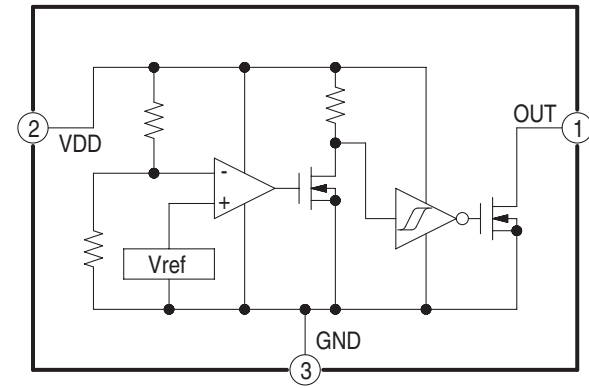
**IC7501
TIMER
IC-DETAIL BLOCK DIAGRAM**



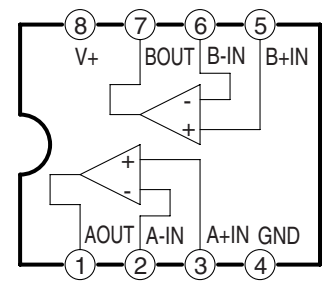
**IC7502
3.3V Detctor
IC-DETAIL BLOCK DIAGRAM**



**IC7514
5V Detctor
IC-DETAIL BLOCK DIAGRAM**

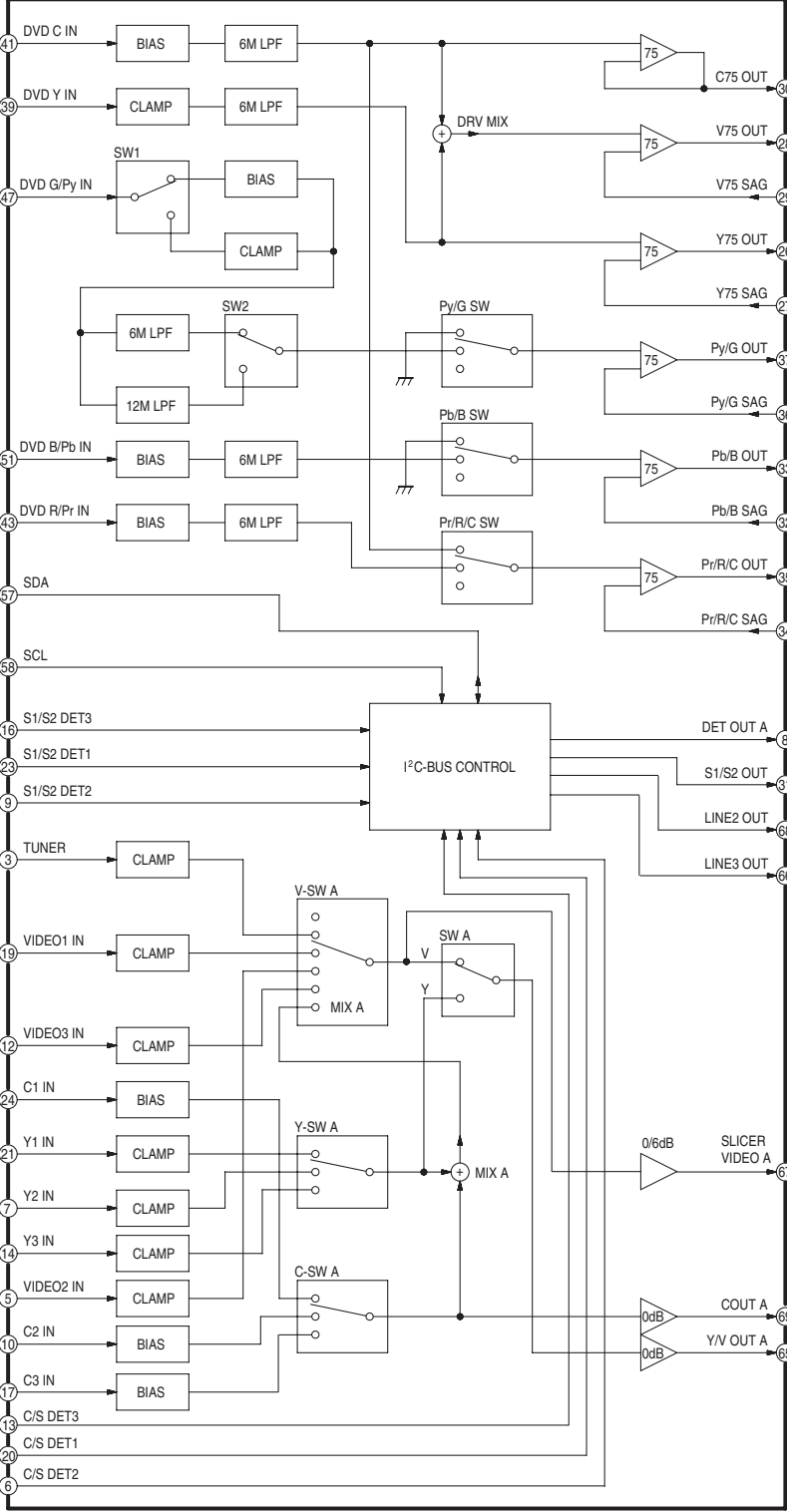


**IC7504
FAN MOTER DRIVE
IC-DETAIL BLOCK DIAGRAM**



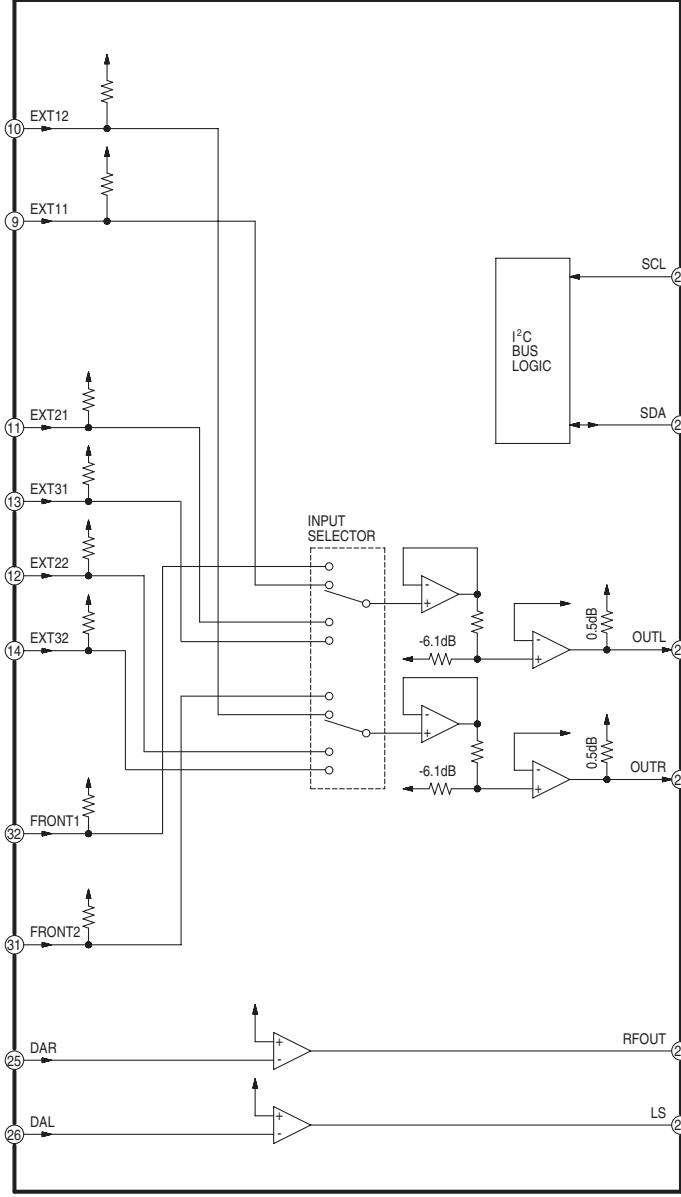
IC3001

VIDEO PROCESSOR



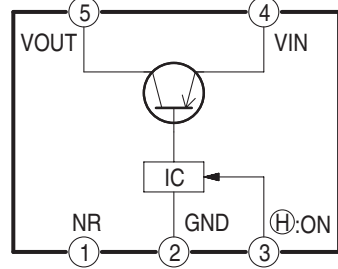
IC4001

AUDIO PROCESSOR



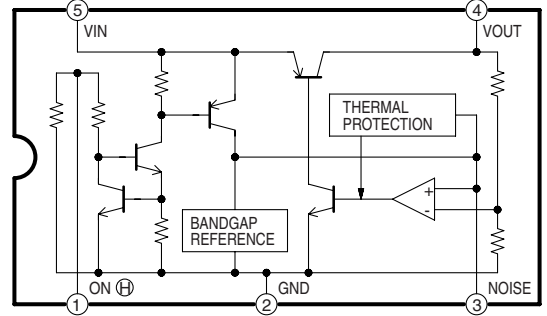
IC4002

AU +5V SWITCHING REGULATOR



IC4003

AU +9V SWITCHING REGULATOR



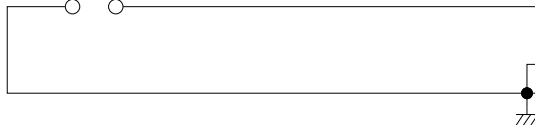
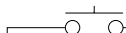
B

A

POWER

S7002

EVQ11A04M



TO P7505
MAIN P.C.B.
(TIMER (3/4) SECTION)

P7001

4	KEY3_POWER
3	NC
2	GND
1	GND

NOTE: DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST, AND MAY BE
SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES15PL
Front(L) Schematic Diagram

1

2

3

4

TO PS57001
DIGITAL P.C.B.
(BE (2/4) SECTION)
P37001
K1KA06B00181
(IMSA-9850B-06Z900)

TPA+	1
TPA-	2
NC	3
NC	4
TPB+	5
TPB-	6

TO DV JACK
P37002
K2HZ104B0012
(IMSA-9390S-04Z901)

1	TPA+
2	TPA-
3	TPB+
4	TPB-

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

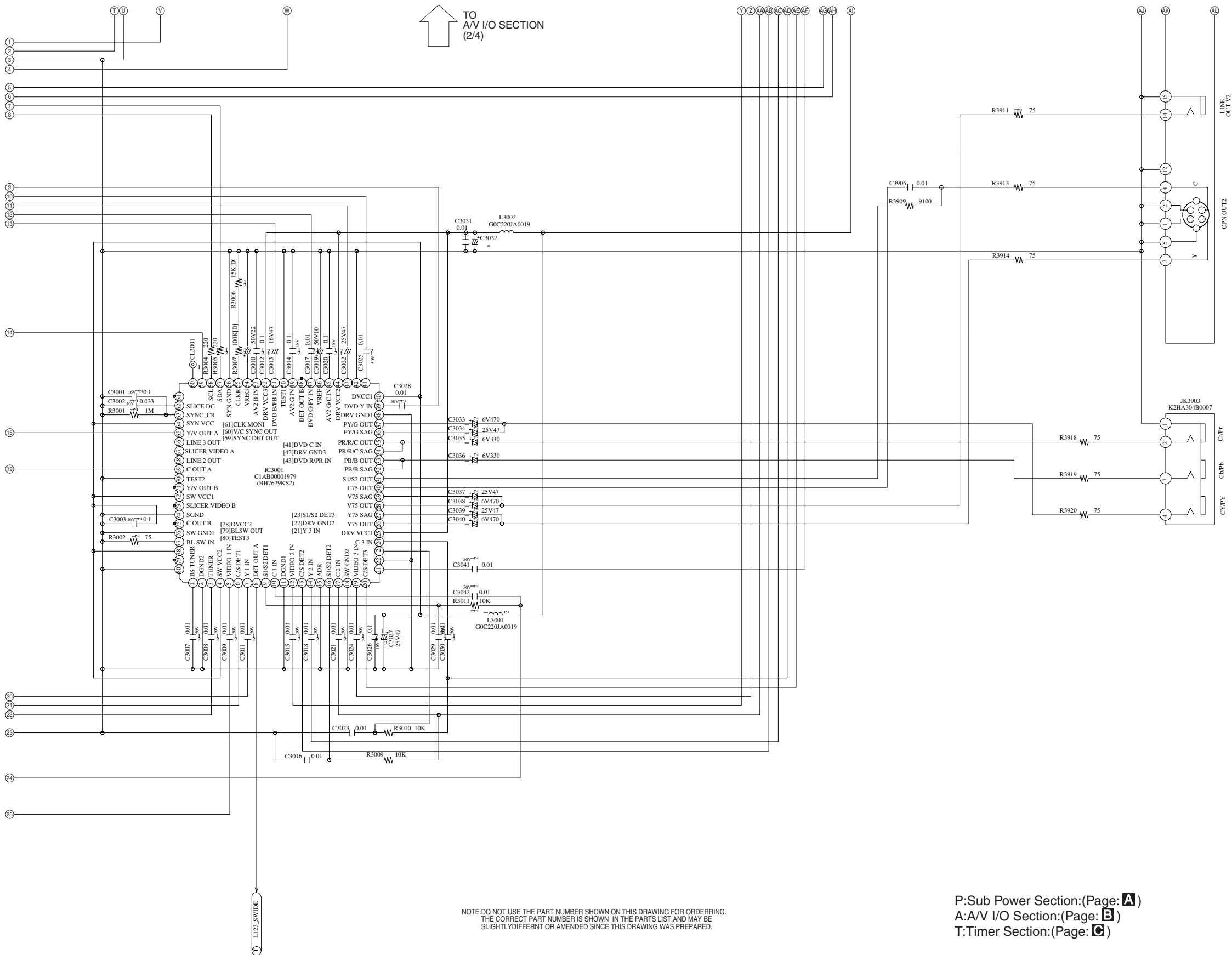
DMR-ES15PL
DV Jack Schematic Diagram

1

2

3

4



LOCATION MAP

1/4	2/4
3/4	4/4

P:Sub Power Section:(Page: **A**)
A:A/V I/O Section:(Page: **B**)
T:Timer Section:(Page: **C**)

DMR-ES15PL
A/V I/O(4/4) Section
(Main P.C.B.(2/3))
Schematic Diagram(A)

B

C

B

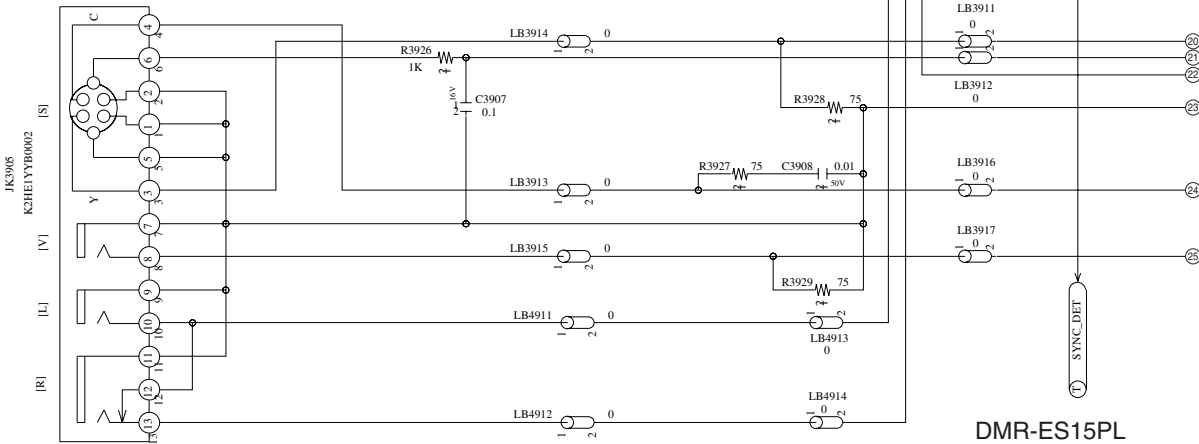
A

↑
TO
A/V I/O SECTION
(1/4)

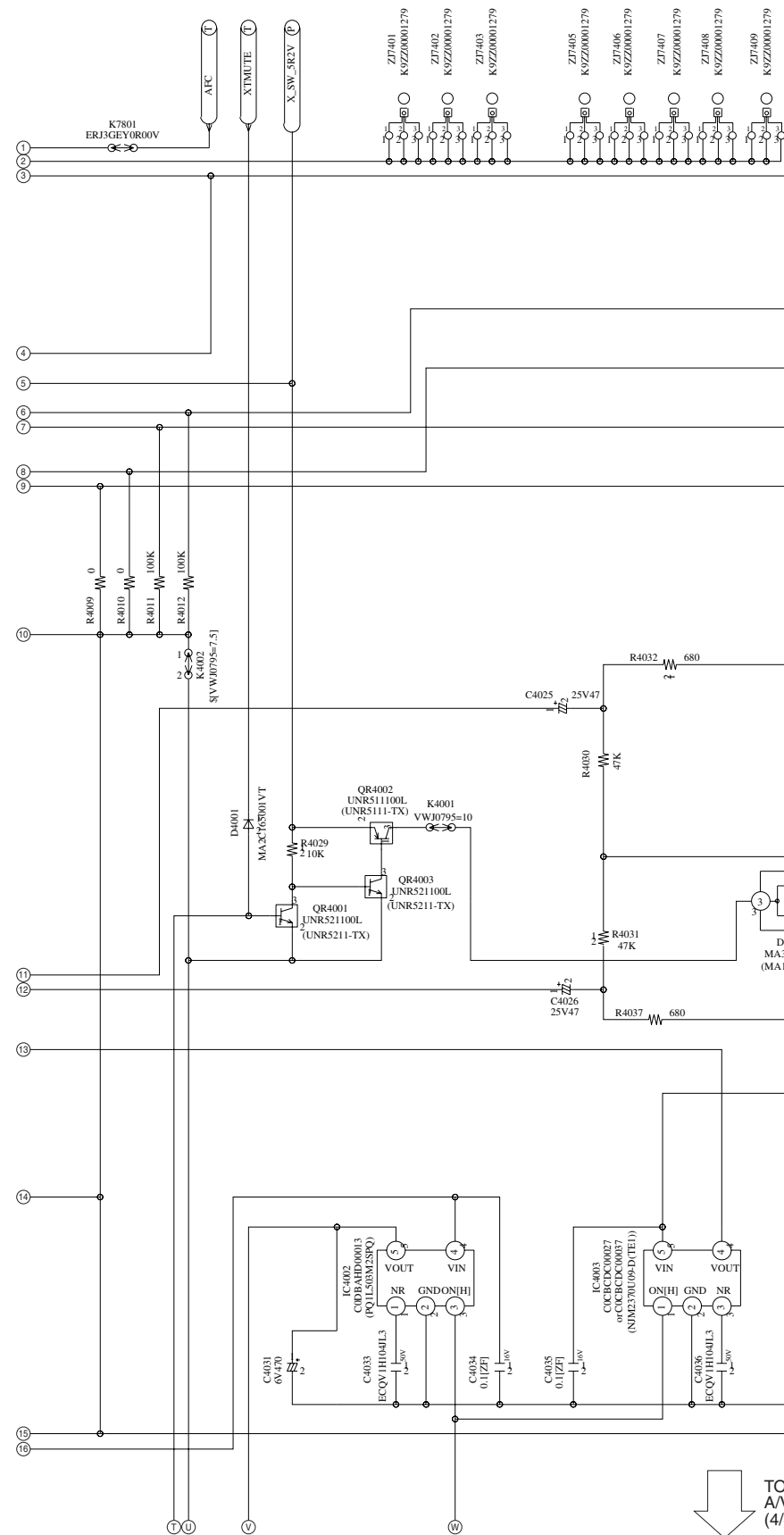
P:Sub Power Section:(Page: **A**)
A:A/V I/O Section:(Page: **B**)
T:Timer Section:(Page: **C**)

LOCATION MAP	
1/4	2/4
3/4	4/4

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.



DMR-ES15PL
A/V I/O(3/4) Section
(Main P.C.B.(2/3))
Schematic Diagram(A)



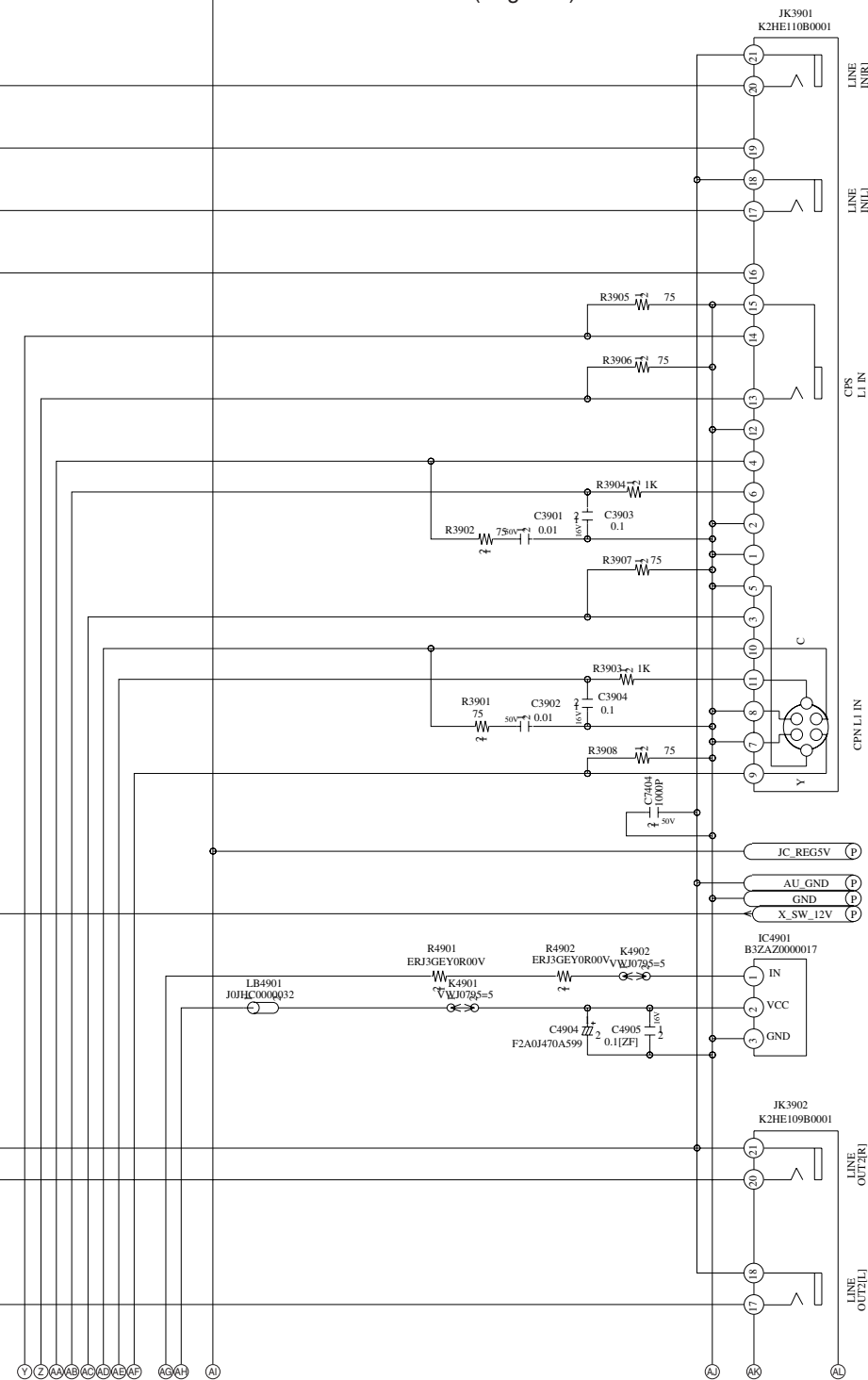
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

P:Sub Power Section:(Page: **A**)
A:A/V I/O Section:(Page: **B**)
T:Timer Section:(Page: **C**)

LOCATION MAP

1/4	2/4
3/4	4/4

B



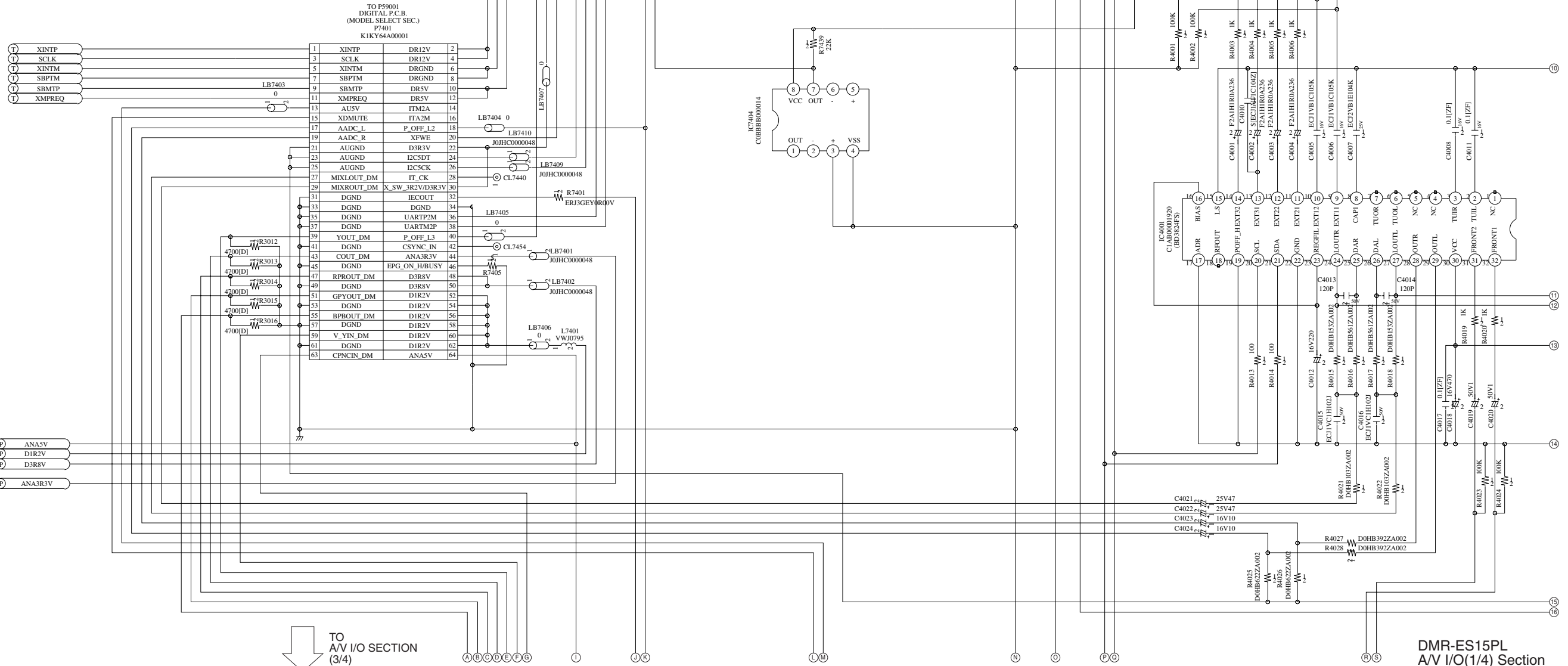
DMR-ES15PL
A/V I/O(2/4) Section
(Main P.C.B.(2/3))
Schematic Diagram(A)

LOCATION MAP

1/4	2/4
3/4	4/4

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST AND MAY BE
SLIGHTLYDIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

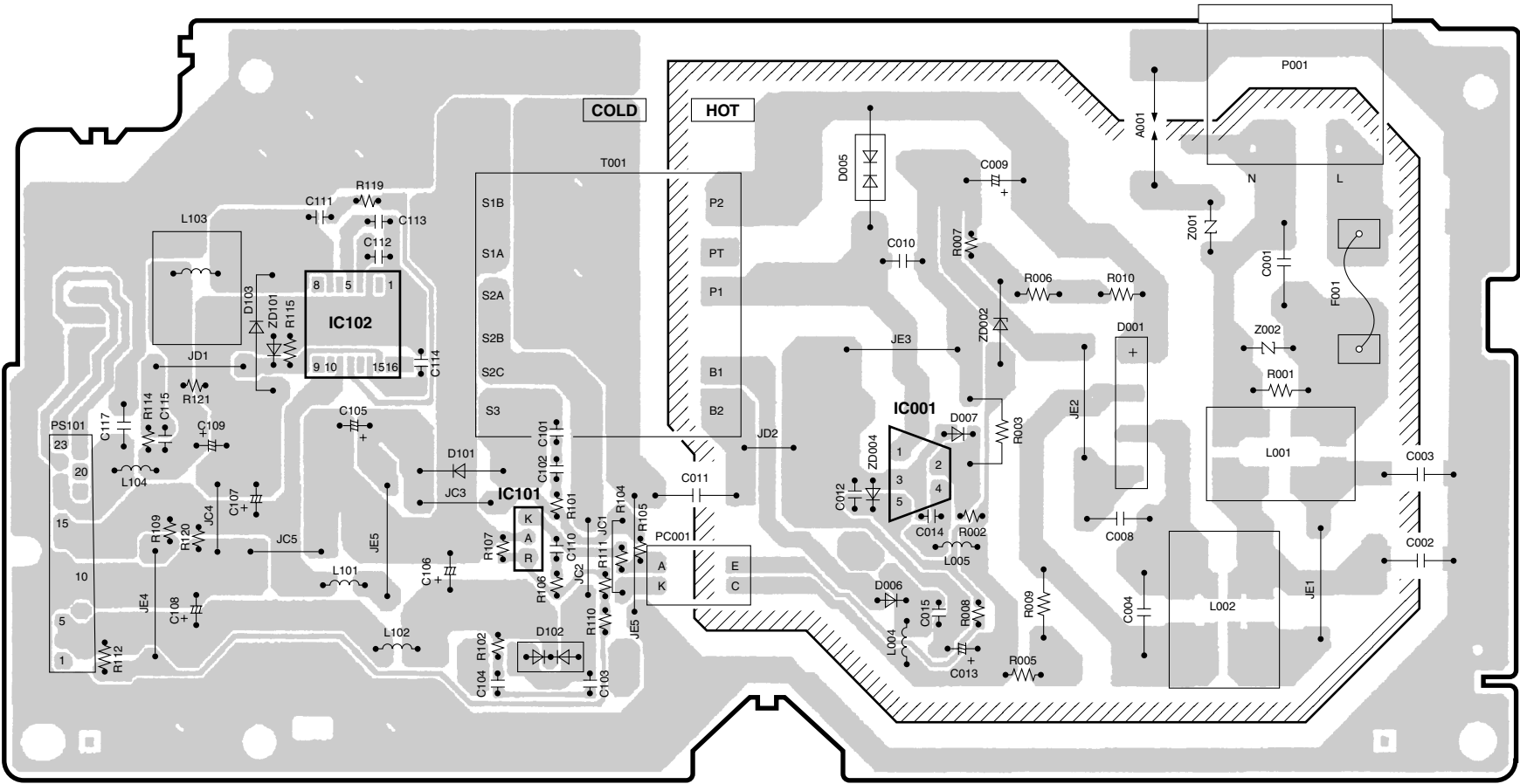
P:Sub Power Section:(Page: **A**)
A:A/V I/O Section:(Page: **B**)
T:Timer Section:(Page: **C**)



DMR-ES15PL
A/V I/O(1/4) Section
(Main P.C.B.(2/3))
Schematic Diagram(A)

Power P.C.B.									
Integrated Circuit		Z002	C-6	Capacitor		C105	B-2	R006	C-5
IC001	B-4	ZD002	C-5	C001	C-6	C106	B-3	R007	C-5
IC101	B-3	ZD004	B-4	C002	B-6	C107	B-2	R008	B-5
IC102	C-2	ZD101	C-2	C003	B-6	C108	B-2	R009	B-5
Connector		Transformer		C004		C109	B-2	R010	C-5
P001	D-6	T001	C-3	C008	B-5	C110	B-3	R101	B-3
PS101	B-1	Coil		C009	C-5	C111	C-2	R102	B-3
Diode		L001	B-6	C010	C-4	C112	C-2	R104	B-3
D001	C-5	L002	B-6	C011	B-4	C113	C-2	R105	B-3
D005	C-4	L004	B-4	C012	B-4	C114	C-3	R106	B-3
D006	B-4	L005	B-5	C013	A-5	C115	B-2	R107	B-3
D007	B-5	L101	B-2	C014	B-5	C117	B-1	R109	B-2
D101	B-3	L102	B-2	C015	B-5	Resistor		R110	B-3
D102	B-3	L103	C-2	C101	B-3	R001	C-6	R111	B-3
D103	C-2	L104	B-1	C102	B-3	R002	B-5	R112	A-1
PC001	B-4	Fuse		C103	A-3	R003	B-5	R114	B-2
Z001	C-6	F001	C-6	C104	A-3	R005	A-5	R115	C-2

Power P.C.B.

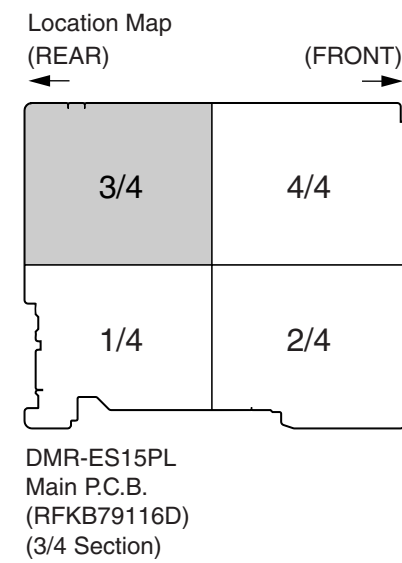


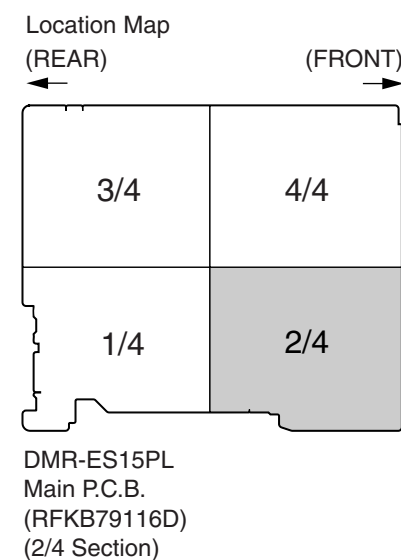
DMR-ES15PL
Power P.C.B.
(ETXMM620M2C)

Main P.C.B.

Integrated Circuit		CL7513	E-3	D7512	F-4	C1513	B-4	C3904	B-7	C7531	F-4	R3914	D-7	R7508	D-4	R7591	E-4
IC1502	E-5	CL7514	E-3	D7801	F-7	C1518	D-7	C3905	D-7	C7532	F-4	R3918	C-6	R7509	D-4	R7592	D-3
IC1504	D-7	CL7515	E-3	Crystal Osillator		C1519	D-7	C3907	A-2	C7533	F-4	R3919	C-6	R7510	E-5	R7593	E-3
IC1505	B-4	CL7516	D-5	X7501	D-4	C1521	B-4	C3908	B-2	C7534	E-4	R3920	C-6	R7513	D-4	R7598	E-2
IC1506	C-3	CL7517	E-3	X7502	E-4	C1522	B-4	C4001	E-6	C7535	E-4	R3926	B-2	R7514	E-4	R7599	E-5
IC1507	B-4	CL7518	E-3	X7503	D-4	C1523	C-3	C4002	E-6	C7538	F-6	R3927	B-2	R7515	E-4	R7600	D-2
IC3001	C-6	CL7519	E-3	X7504	E-4	C1524	C-3	C4003	E-6	C7561	E-5	R3928	B-2	R7516	E-4	R7601	F-2
IC4001	E-6	CL7520	E-3	IC Protector		C1525	C-3	C4004	E-6	C7823	F-7	R3929	B-2	R7517	E-4	R7603	D-2
IC4002	C-3	CL7521	E-3	IP1501	B-6	C1526	B-4	C4005	E-6	C7824	F-7	R4001	F-7	R7518	E-4	R7604	D-2
IC4003	D-6	CL7522	D-3	IP7501	F-3	C1527	B-4	C4006	E-7	C7825	F-6	R4002	F-7	R7519	E-4	R7605	F-2
IC4901	A-8	CL7523	D-5	Coil		C1528	B-4	C4007	E-7	C7826	F-7	R4003	C-7	R7520	E-4	R7801	F-7
IC7401	D-6	CL7524	F-5	L1503	B-4	C1539	B-3	C4008	E-6	C7827	F-7	R4004	C-7	R7521	E-3	R7802	F-7
IC7404	F-5	CL8005	A-7	L1504	B-2	C1541	B-3	C4011	E-6	C7828	F-7	R4005	C-7	R7522	D-4	R7812	F-6
IC7501	E-4	CL8006	A-7	L3001	C-6	C1550	D-6	C4012	E-6	C7829	F-7	R4006	B-7	R7523	D-4	R7814	F-7
IC7502	E-4	CL8007	A-7	L3002	C-7	C1553	C-2	C4013	E-6	C7830	F-7	R4009	B-7	R7524	D-4	R7815	F-7
IC7514	F-5	CL8008	A-7	L7401	B-4	C3001	C-6	C4014	E-6	C8001	A-6	R4010	C-7	R7525	D-4	R7816	F-6
Transistor		CL8009	A-7	L7501	F-3	C3002	C-6	C4015	E-6	C8002	A-6	R4011	B-7	R7526	D-4	R8001	A-7
Q1501	B-3	CL8010	A-7	L7502	F-5	C3003	B-6	C4016	E-6	C8003	A-6	R4012	C-7	R7527	D-3	Switch	
Q4003	E-7	CL8011	A-7	L7503	E-2	C3007	B-6	C4017	E-6	C8004	A-6	R4013	E-6	R7528	D-3	S7501	F-2
Q4004	F-7	CL8012	A-7	LB1502	B-6	C3008	B-6	C4018	E-6	C8006	A-6	R4014	E-6	R7533	D-3	S7502	E-2
Q7401	C-5	CL8013	A-7	LB1503	B-6	C3009	B-6	C4019	D-7	C8007	A-6	R4015	E-6	R7534	D-3	S7503	E-2
Q7402	C-5	CL8014	A-7	LB1505	B-6	C3010	C-6	C4020	E-7	C8008	A-6	R4016	E-6	R7535	D-3	S7505	D-2
Q7501	F-3	CL8015	A-7	LB1506	B-6	C3011	B-6	C4021	E-6	C8010	A-6	R4017	E-6	R7536	F-3	S7506	C-2
Q7502	F-4	CL8016	A-7	LB3911	B-3	C3012	C-6	C4022	D-6	C8013	A-5	R4018	E-6	R7541	E-5	S7507	D-2
Q7503	F-3	CL8017	A-7	LB3912	B-3	C3013	C-6	C4023	C-4	Resistor		R4019	E-6	R7543	F-3	Transformer	
Q7504	D-4	CL8018	A-7	LB3913	B-2	C3014	C-6	C4024	C-4	R1503	B-4	R4020	E-6	R7545	F-4	T7501	F-4
Q7510	D-3	CL8019	A-7	LB3914	B-2	C3015	B-7	C4025	E-7	R1509	C-3	R4021	E-6	R7546	F-3	Battery	
Q7511	E-4	CL8020	A-7	LB3915	B-2	C3016	B-7	C4026	E-7	R1510	C-3	R4022	E-6	R7548	F-3	B7501	E-5
Q7513	E-4	TL7401	D-5	LB3916	B-3	C3017	C-6	C4029	E-7	R1511	D-3	R4023	D-7	R7549	F-3	Display	
Q7514	D-3	TL7501	D-3	LB3917	B-3	C3018	B-7	C4030	E-7	R1518	B-3	R4024	E-7	R7550	F-4	DP7501	D-2
Q7801	F-7	TL7502	F-5	LB4901	B-7	C3019	C-6	C4031	C-4	R1519	B-3	R4025	C-4	R7551	F-4	Remote IR	
Transistor-resistor		TL7503	D-5	LB4911	B-2	C3020	C-6	C4033	C-4	R1522	A-5	R4026	C-4	R7552	E-4	IR7501	F-2
QR1501	B-3	TL7504	E-3	LB4912	B-2	C3021	C-7	C4034	C-3	R3001	C-6	R4027	D-4	R7553	F-4	Tuner	
QR1502	A-5	TL7505	D-5	LB4913	B-3	C3022	C-6	C4035	D-6	R3002	B-6	R4028	D-4	R7554	E-4	TU7801	F-7
QR4001	F-5	TL7506	D-4	LB4914	B-3	C3023	C-7	C4036	D-6	R3004	C-6	R4029	F-5	R7555	E-4		
QR4002	F-5	TL7507	D-4	LB7401	B-4	C3024	C-7	C4904	B-7	R3005	C-6	R4030	E-7	R7558	E-4		
QR4003	F-5	TL8004	A-7	LB7402	B-4	C3025	C-6	C4905	A-7	R3006	C-6	R4031	E-7	R7559	D-4		
QR7501	E-3	Connector		LB7403	C-4	C3026	C-6	C7403	D-5	R3007	C-6	R4032	E-7	R7560	F-5		
QR7502	E-4	JK3901		LB7404	C-3	C3027	B-6	C7404	B-3	R3009	B-7	R4037	E-7	R7561	B-6		
QR7503	D-4	JK3902		LB7405	B-4	C3028	C-6	C7504	D-4	R3010	C-7	R4038	E-7	R7562	D-3		
Test Point		JK3903		LB7406	C-4	C3029	B-7	C7505	D-4	R3011	B-7	R4039	E-7	R7563	D-3		
CL3001	C-6	JK3905	B-2	LB7407	B-4	C3030	C-7	C7506	D-4	R3012	C-4	R4040	E-7	R7564	E-4		
CL7440	C-4	P1501	B-6	LB7409	C-4	C3031	C-7	C7507	E-4	R3013	C-4	R4043	E-7	R7569	E-4		
CL7454	C-4	P7401	C-4	LB7410	C-4	C3032	C-7	C7508	E-4	R3014	C-4	R4901	A-7	R7570	D-3		
CL7479	C-4	P7505	A-2	LB7501	F-4	C3033	C-6	C7509	E-4	R3015	C-4	R4902	A-7	R7572	D-3		
CL7501	E-4	Diode		LB7503	F-4	C3034	C-6	C7512	D-4	R3016	C-4	R7401	B-4	R7573	D-4		
CL7502	D-3	D4001	E-5	LB7504	F-4	C3035	C-6	C7513	E-4	R3901	B-7	R7402	D-6	R7574	D-2		
CL7503	E-4	D4003	E-7	LB7801	F-7	C3036	C-7	C7514	F-5	R3902	B-7	R7403	D-6	R7575	C-2		
CL7504	E-4	D7401	D-6	LB7802	F-7	C3037	C-7	C7516	E-4	R3903	B-7	R7404	B-5	R7576	E-4		
CL7505	E-4	D7502	F-3	LB8001	A-5	C3038	C-7	C7519	D-3	R3904	B-7	R7406	D-6	R7582	E-3		
CL7506	C-2	D7504	F-4	Capacitor		C3039	C-6	C7521	E-4	R3905	B-7	R7439	F-6	R7584	E-4		
CL7507	E-2	D7506	F-3	C1504	B-6	C3040	C-7	C7522	E-2	R3906	B-7	R7501	E-4	R7585	D-2		
CL7508	E-3	D7507	F-4	C1505	B-6	C3041	B-7	C7523	D-4	R3907	B-7	R7502	E-4	R7586	E-2		
CL7509	E-3	D7508	F-4	C1509	E-5	C3042	B-7	C7524	E-3	R3908	B-7	R7504	D-4	R7587	E-2		
CL7510	E-3	D7509	F-5	C1510	E-5	C3901	B-7	C7525	E-2	R3909	D-7	R7505	E-4	R7588	E-2		
CL7511	E-3	D7510	F-5	C1511	E-6	C3902	D-7	C7527	F-3	R3911	E-7	R7506	E-4	R7589	E-2		
CL7512	E-3	D7511	F-3	C1512	B-5	C3903	B-7	C7530	F-3	R3913	D-7	R7507	D-4	R7590	E-4		

D





C

B

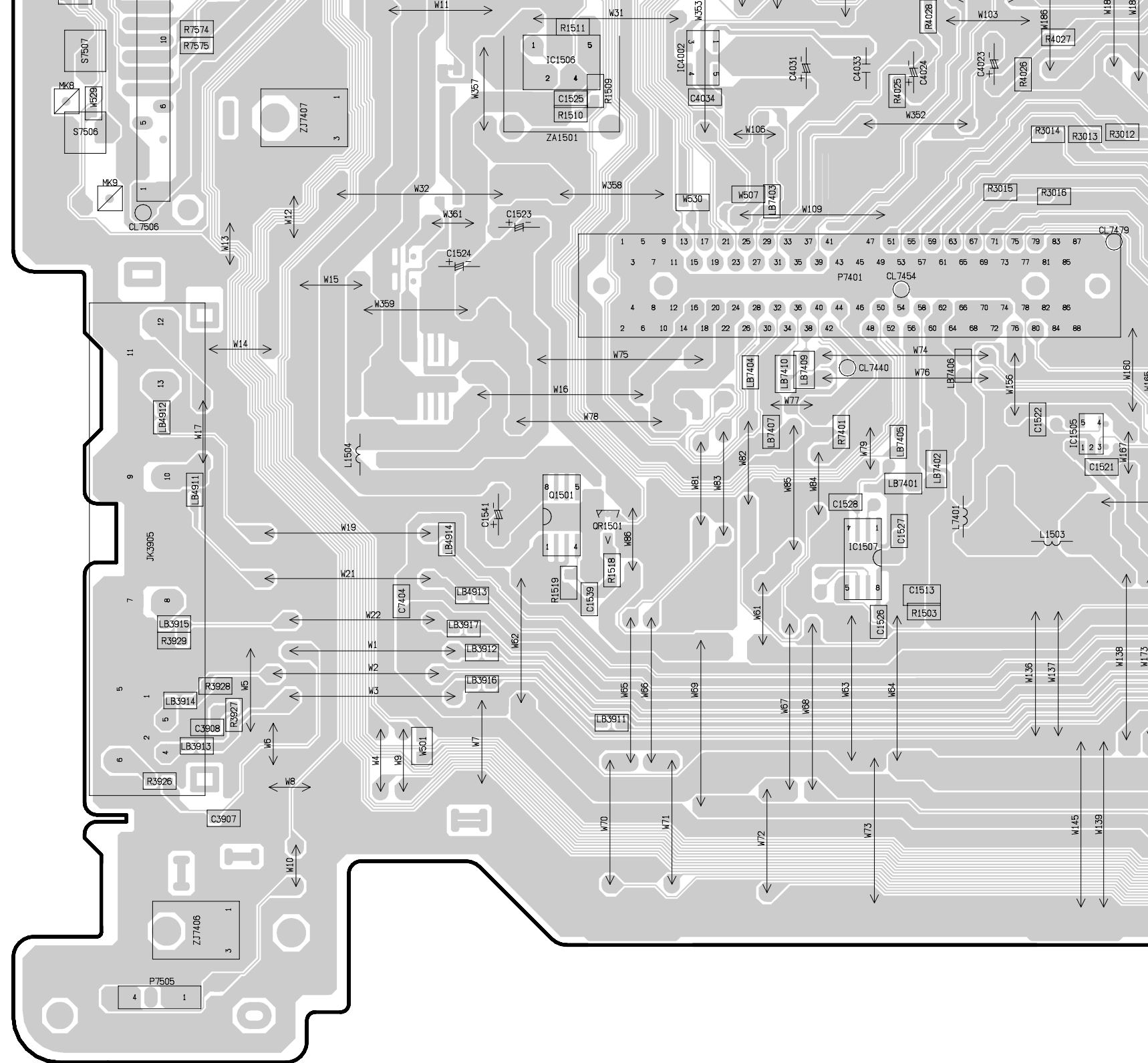
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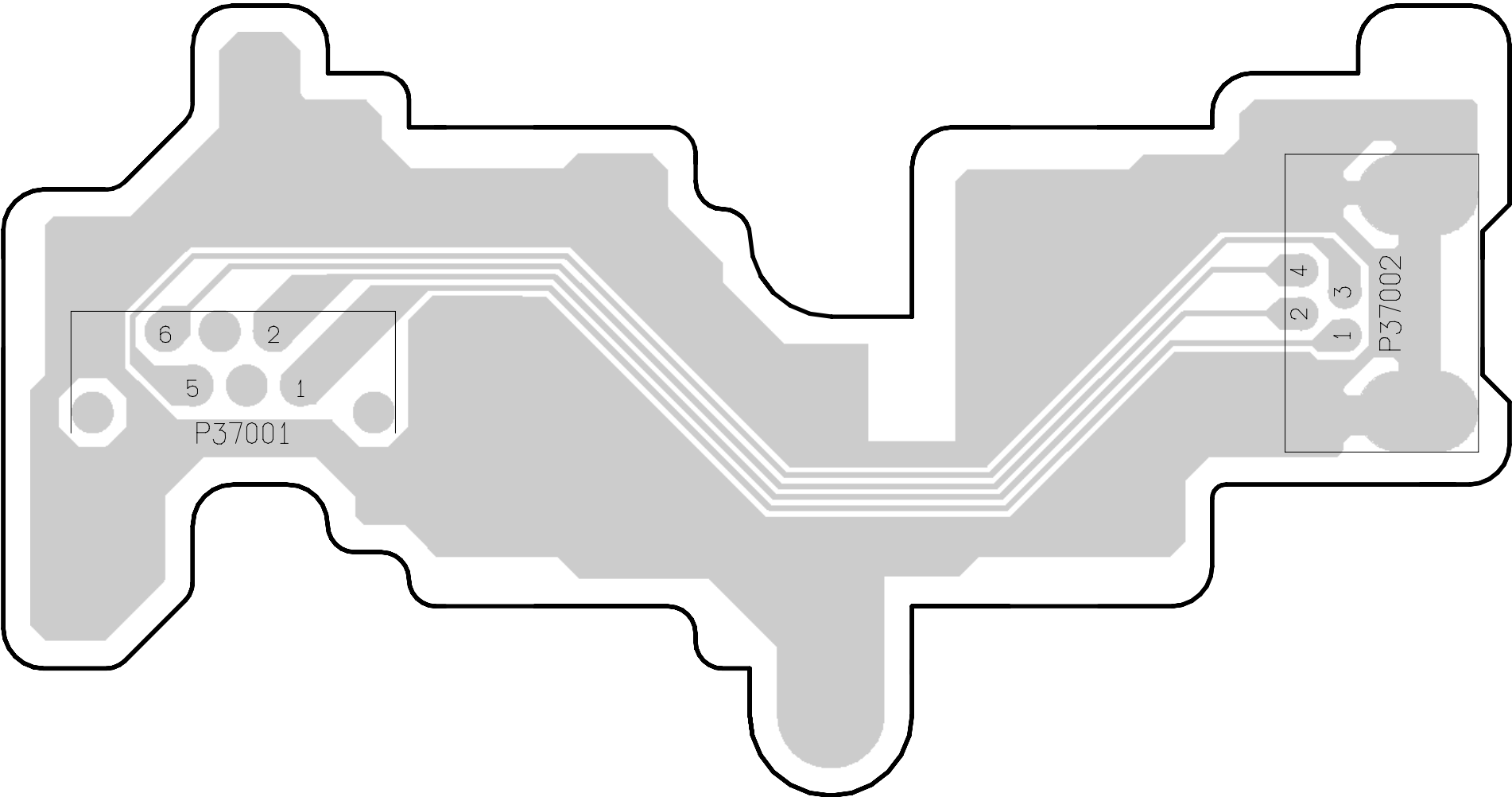
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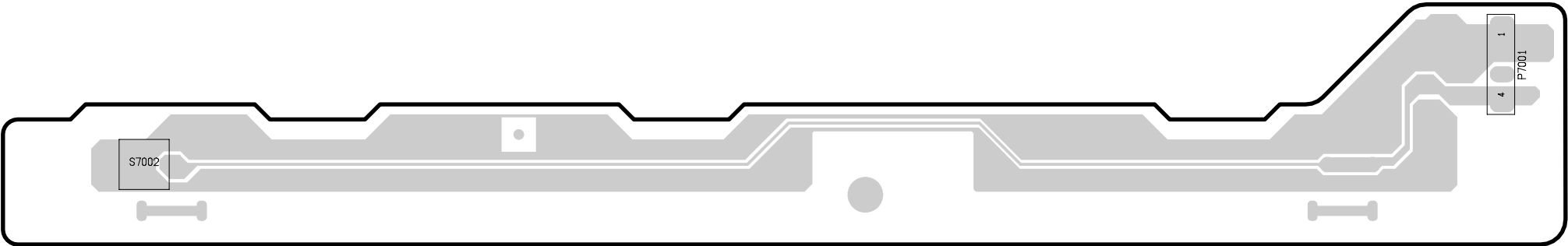
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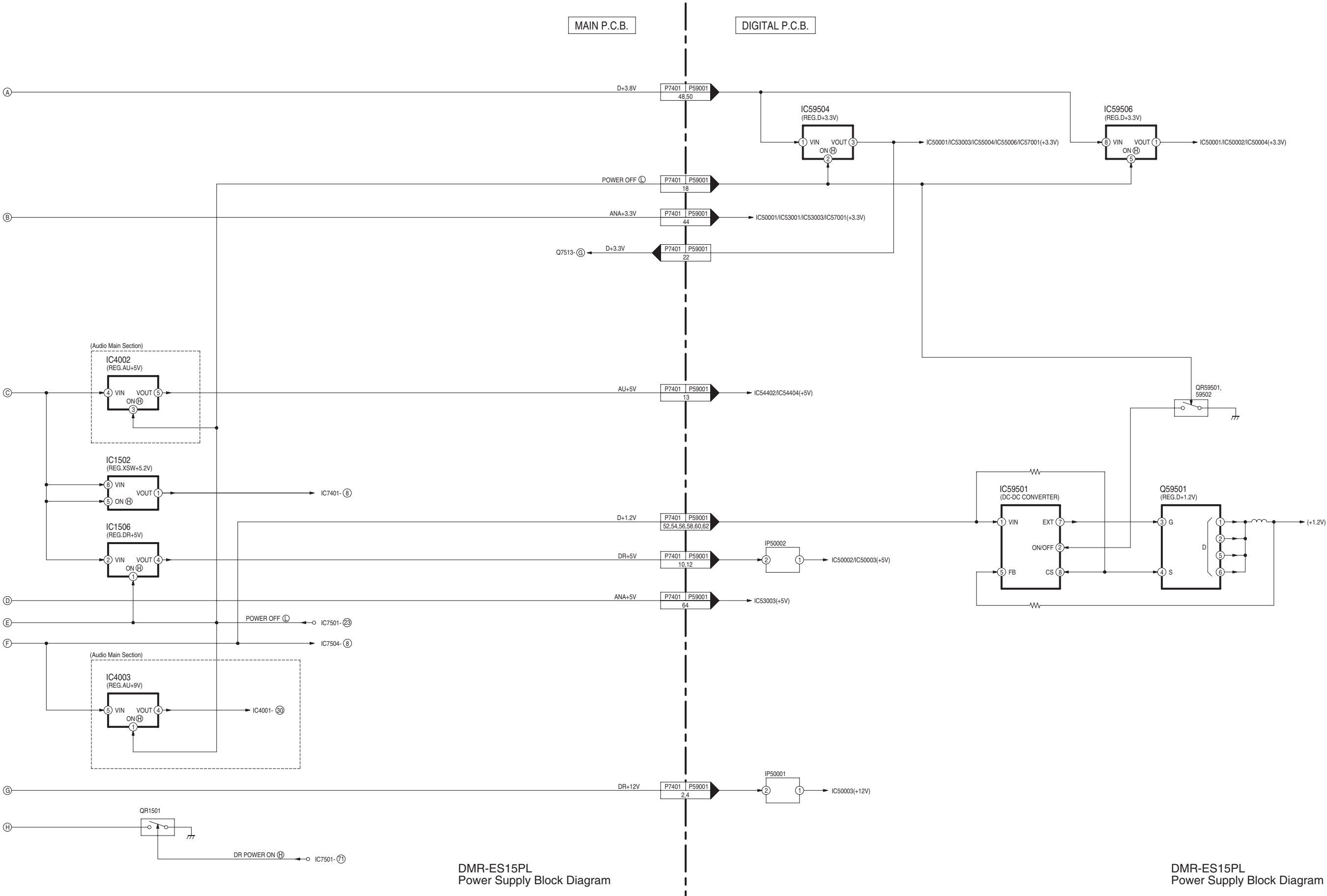
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Front (L) P.C.B.

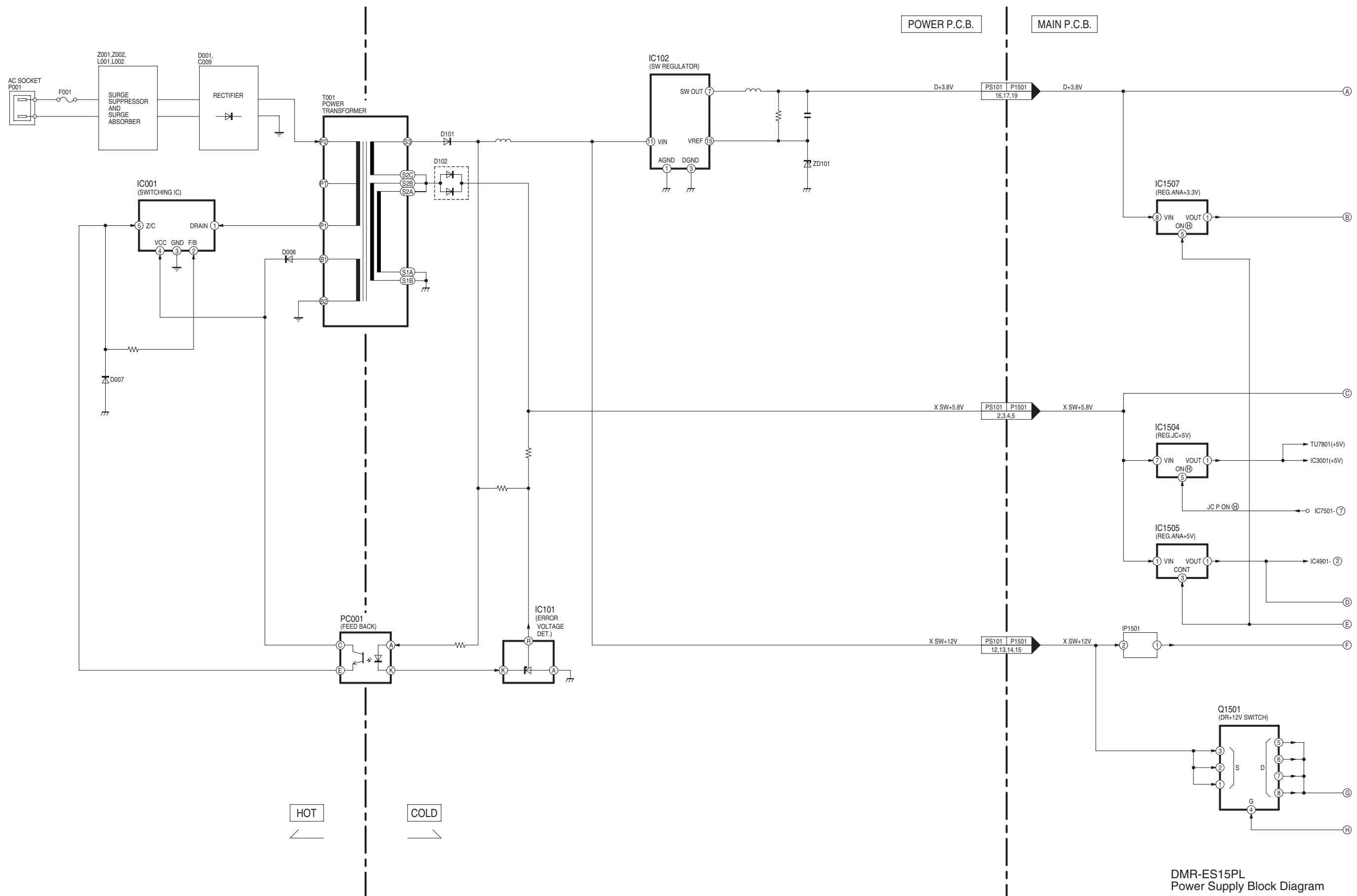


DMR-ES15PL
Front (L) P.C.B.
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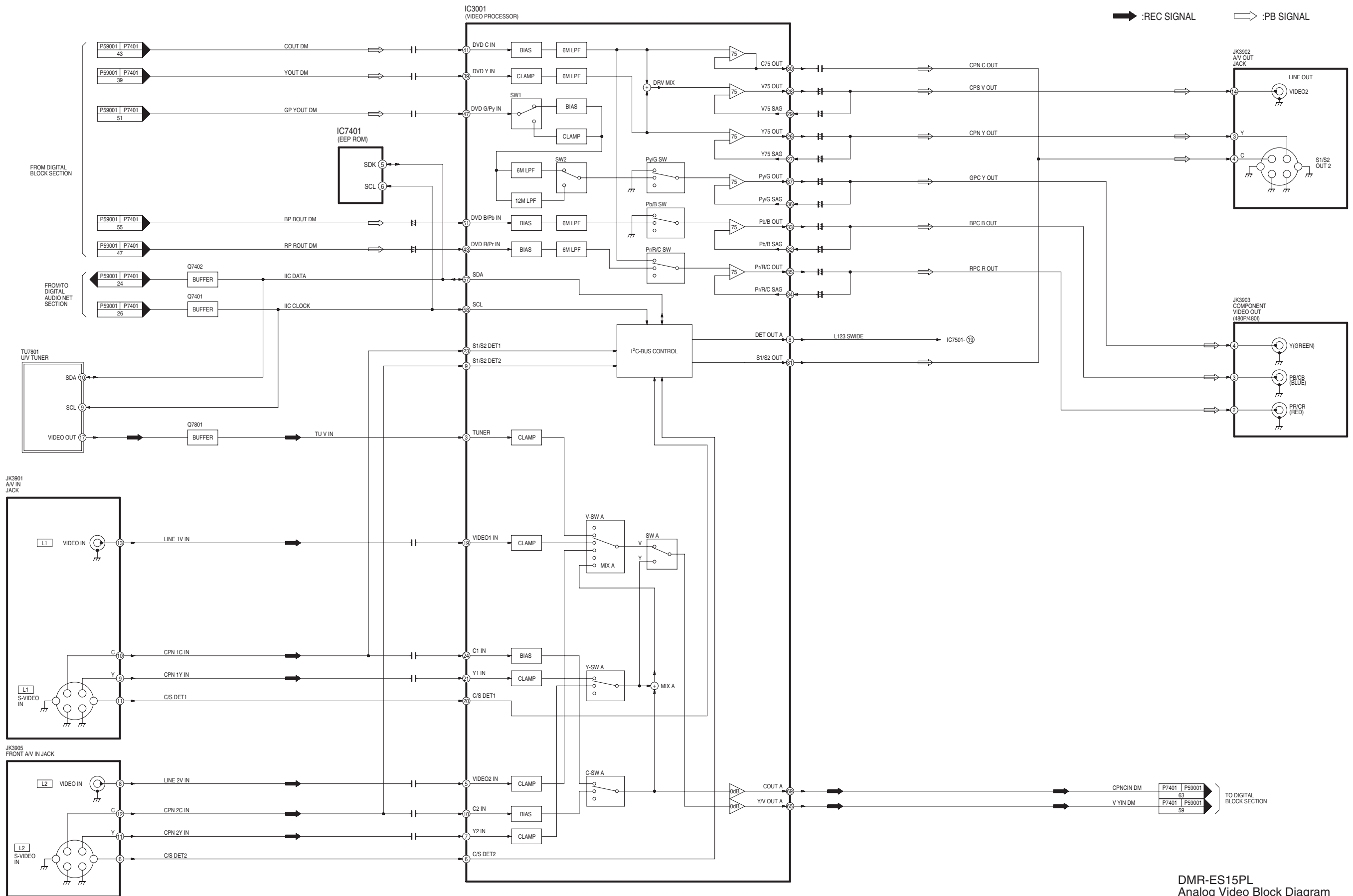


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Power Supply Block Diagram

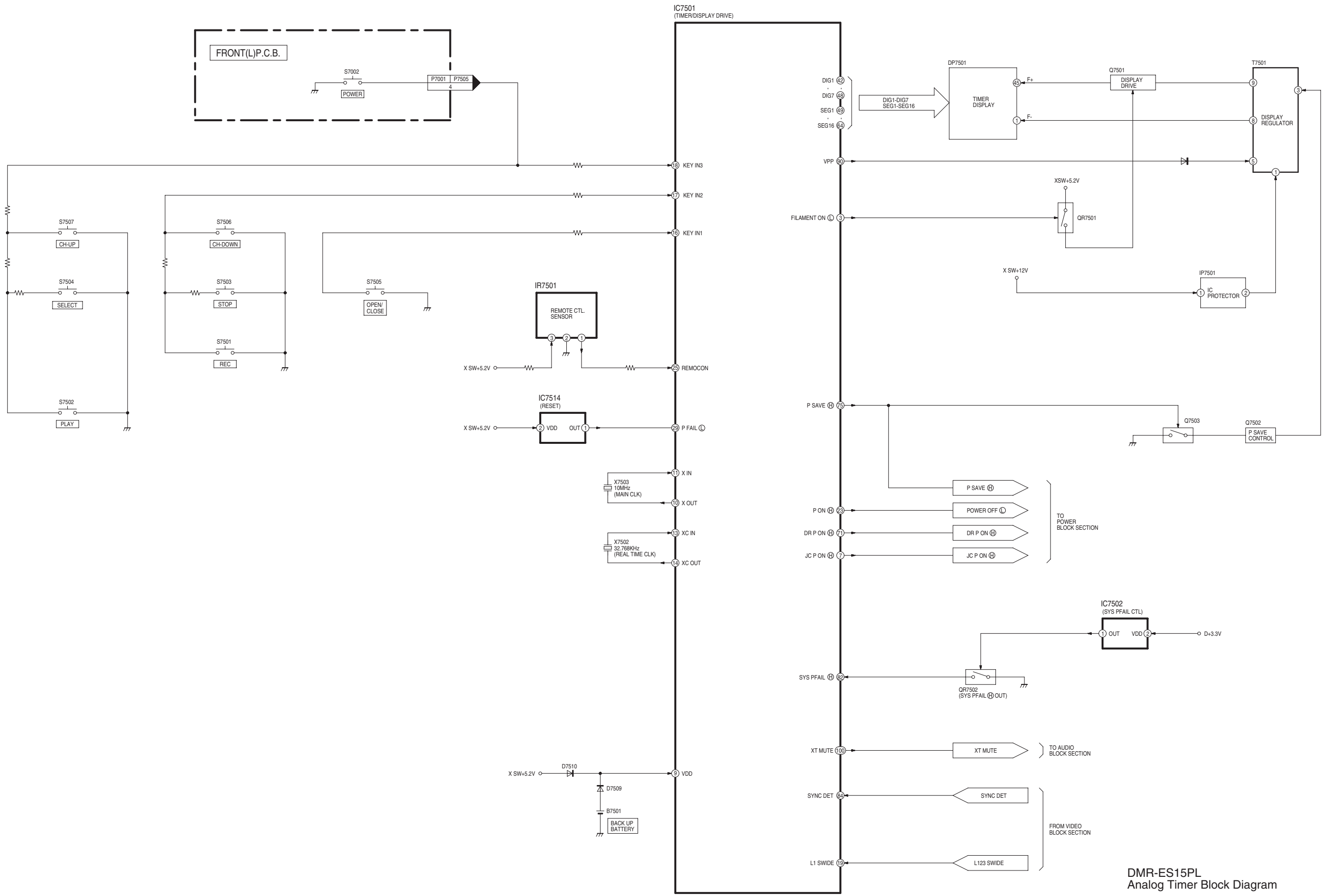
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Power Supply Block Diagram



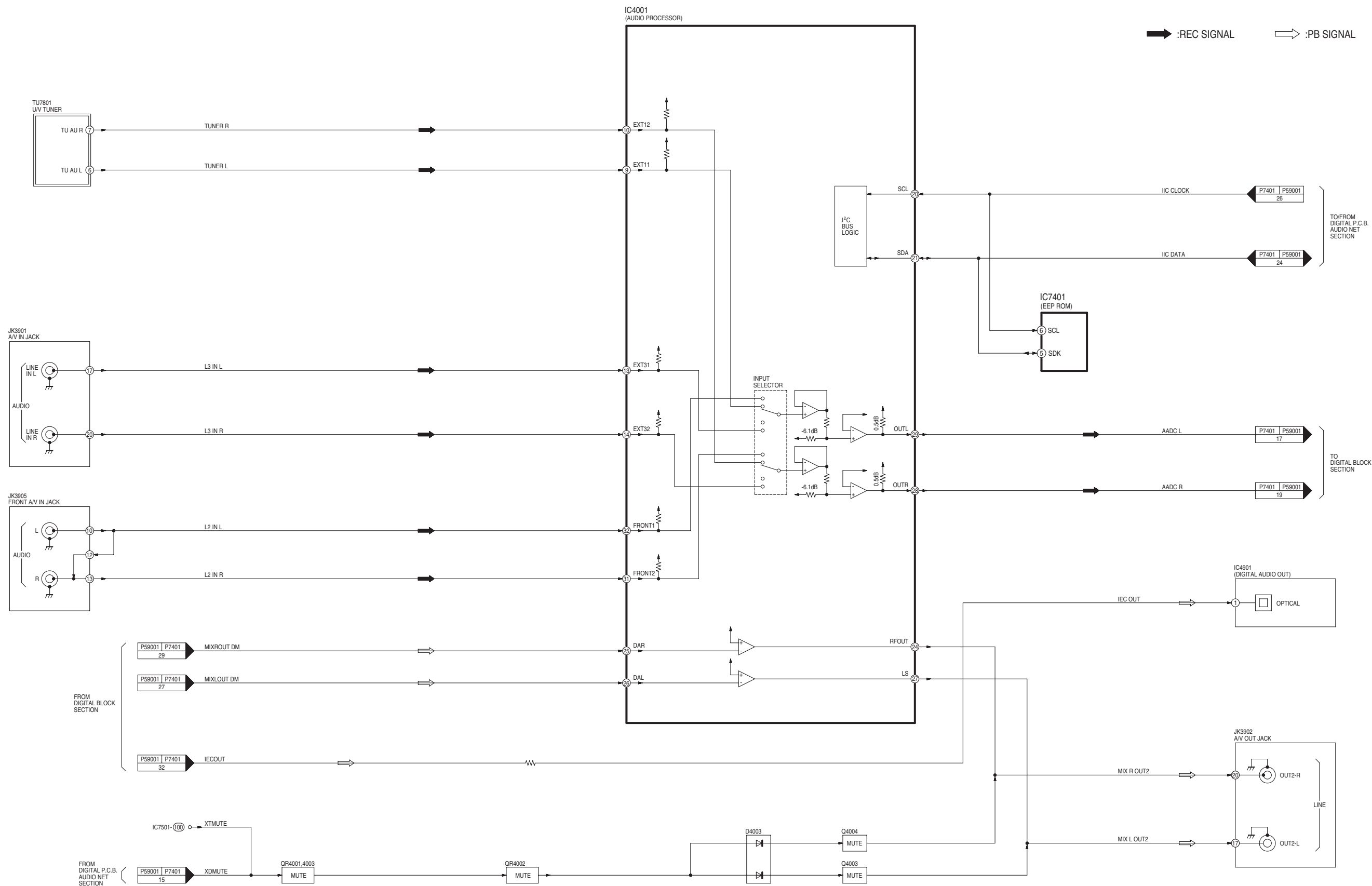
DMR-ES15PL
Power Supply Block Diagram



DMR-ES15PL
Analog Video Block Diagram



DMR-ES15PL
Analog Timer Block Diagram



DMR-ES15PL
Analog Audio Block Diagram